WESTERN STATES EDITION

DOMESTIC ENGINEERING

Whole No. 710 Chicago and New York, Saturday, July 21, 1906 Vol. XXXVI. No. 3. $1.00 a Year

LIBRARY OHIO STATE UNIVERSITY.

MULLANPHY HOSPITAL, ST. LOUIS, warmed by 10,000 square feet of AMERICAN Radiation, St. Louis Steam pattern, installed by Elliott & Barry Engineering Company, St. Louis, Heating Contractors. A. M. Milligan, St. Louis, Architect.

AMERICAN RADIATOR COMPANY

General Offices, 282-284 Michigan Avenue, Chicago.

See Page 71 for Addresses of Sales Branches

SHOW WINDOWS

ought to be well lighted, if at all. Not a single objection can be raised against the Frink system of show window lighting. The best stores use it.

I. P. FRINK, - - 551 Pearl St., New York

STRONG AND ECONOMICAL

The best for dealers to carry.

Star Expansion Bolt Co.
147-149 Cedar St., New York City

If you want more business

Use United Brass Goods

United Brass Mfg. Co.
CLEVELAND, O.

RELIABLE CONNECTIONS made between Lead and Iron Pipe by using the Raymond Ferrule—the only Lead Ferrule on the market which has an **extra thickness of lead over the shoulder,** giving strength where it is needed and where other lead ferrules are weak. The genuine article bears our label.

RAYMOND LEAD CO.

Crosby Spring Seat Globe and Angle **Valves** All Parts Interchangeable. All Parts Removable. Tested for Highest Pressures. **Leak-Proof** CROSBY STEAM GAGE & VALVE CO. Boston New York Chicago

HEAT in the Latin is CALOR

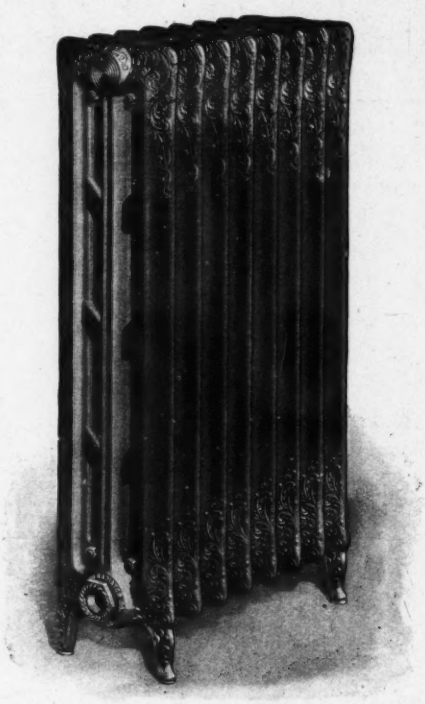
From this the French Calorie, unit of heat, the standard used by scientists.

See the appropriateness?

CALOR Radiators—Heat Radiators

The Standard, not only as regards efficiency but for elegance of design, beauty of ornamentation, smoothness of castings, completeness of line.

They are made by the



Holland Radiator Company

38 DEARBORN STREET, CHICAGO

Adopt the Standard. Specify the CALOR.

TABOR MOLDING MACHINES ARE THE BEST

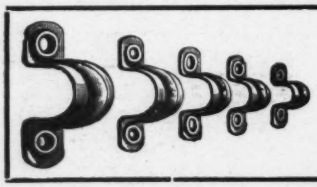
CALL OR WRITE US FOR PARTICULARS

TABOR MFG. CO., - 18th and Hamilton Streets, Philadelphia, Pa.

We make **AIR CELL** Wool Felt and Asbestos Magnesia Sectional Pipe Coverings

High Quality Low Discounts

NATIONAL AIR CELL COVERING CO., 70-78 Third St., S. Brooklyn, N.Y.



MALLEABLE AND WROUGHT PIPE HOOKS AND STRAPS

Complete stock of every size and kind. Quality the best that can be made. B. B. Ornamental Pipe Straps, all even, clean cut, brightly tinned. **Ask for Catalogue and Prices.**

Berger Bros. Co., 231-237 Arch Street, Philadelphia, Pa.

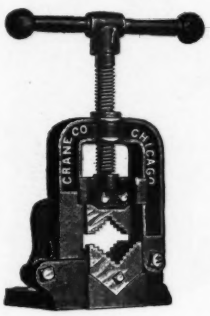
REGULATORS
STEAM
WATER

Ross Valve Co.

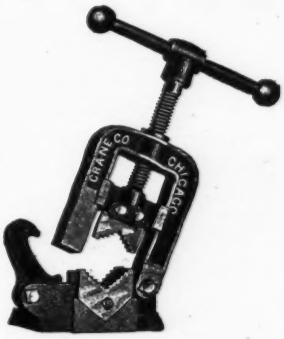
TROY, N. Y.

INDEX TO ADVERTISEMENTS ON PAGE XXIV.

CRANE MALLEABLE IRON PIPE VISES



The malleable iron pipe vise is preferable to the cast iron vise in every respect, being much lighter, more durable and cheaper. The Crane malleable vise has interchangeable cut steel jaws and is constructed to do the heaviest work, great care having been taken in manufacturing the various parts and the strength put where it is most required.



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BALTIMORE
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KANSAS CITY
OMAHA

CRANE CO.

CHICAGO

ESTABLISHED 1855

SIOUX CITY
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MINNEAPOLIS
DULUTH
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PORTLAND, ORE.
SAN FRANCISCO
OAKLAND
LOS ANGELES

GURNEY

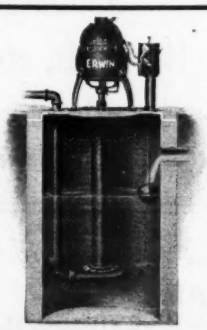
HOT WATER HEATERS, STEAM BOILERS, RADIATORS.

THEY GIVE COMPLETE SATISFACTION
Send for latest Catalogues

GURNEY HEATER MFG. CO.,

N. Y. BRANCH III FIFTH AVENUE, NEW YORK.

188-200 Franklin St., Cor. Pearl, BOSTON, MASS.

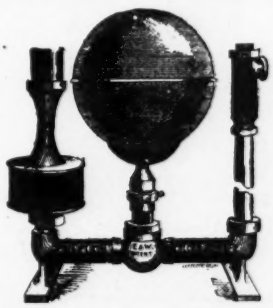


Automatic Electric Ejector Bilge Pump

For removing automatically water in basements, boiler pits and catch basins below level of sewer. Also elevates return water in heating systems. Either vertical direct, or alternating electric current motor operates it. Pump automatically starts when water reaches certain height and stops when sump is emptied.

The Perfection Automatic Cellar Drainer

with city water pressure or steam; pumps water from cellars, wheel-pits, ash-pits or excavations, turning on water when water in sump reaches a certain height, and shutting it off when sump is empty. The best drainer for the plumber. Write today for circular.



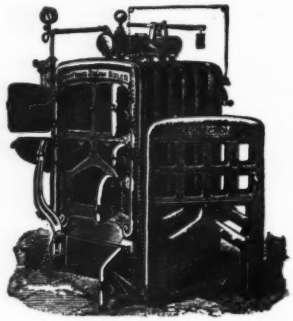
ERWIN & COMPANY

70 Dearborn St. CHICAGO

BOYNTON

THE FIRST BEST

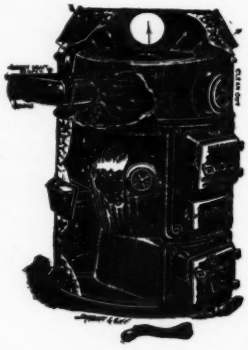
It's easy to say our hot air furnaces, steam and water heaters are the best—anyone can say that, but our record since 1849 warrants us in claiming superiority.



Steam Heater

PIONEER

THE BEST FIRST



Coal Furnace

Great variety and large stocks to draw on.

The Boynton Furnace Co.

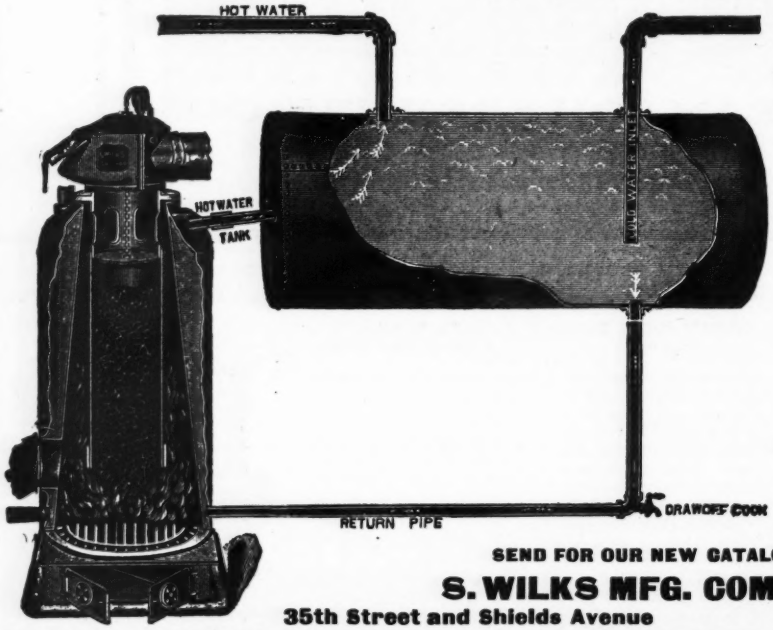
147-149 Lake Street, CHICAGO

207-209 Water Street, NEW YORK

HEATERS

ALWAYS THE BEST

WILKS HOT WATER HEATERS



For Heating Water for

Residences, Apartment buildings, Hospitals, etc.

Steel Storage Tanks

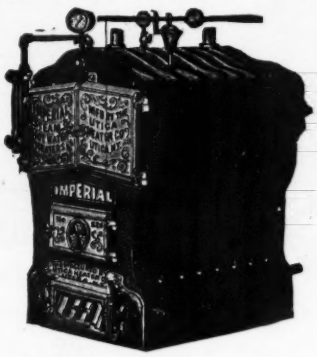
SEND FOR OUR NEW CATALOGUE

S. WILKS MFG. COMPANY

35th Street and Shields Avenue CHICAGO, ILL.

READ THE ADVERTISEMENTS

Famous Imperial Boilers



"IMPERIAL"

We want every steamfitter to have our new catalogue of Imperial Boilers—and learn all about this wonderful line of Sectional and Round Steam and Hot Water Boilers. There are no better boilers made at any price. Send for catalogue to-day. : : : : : : :

Utica Heater Co., Utica, N. Y.

Chicago Representatives,
Chicago Heater & Supply Co., 56 and 58 Dearborn St., Chicago, Ill.

The Best Underground Steam Pipe Conduit

Portland Sectional Conduit

Indestructible. Easy to install. Costs nothing to maintain. Roll frame Pipe Supports obviate expansion of joints. Better than overhead piping for Plants, Assembling and Heating Systems.

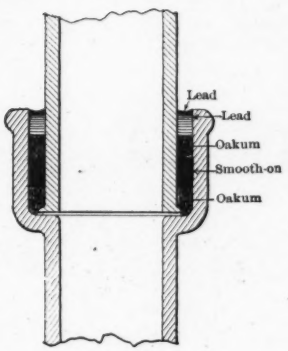
Insulating effiency—88 per cent
Send for catalogue and test booklet

H. W. JOHNS-MANVILLE CO.

Manufacturers of Asbestos and Magnesia Products, Electrical Insulating Materials, "Noark" Fuse Devices, Electrical Railway Supplies, Etc.

New York	Boston	Pittsburg	New Orleans
Milwaukee	Philadelphia	Cleveland	Kansas City
Chicago	St. Louis	Minneapolis	Los Angeles
Dallas	Seattle	San Francisco	London (227)

SMOOTH-ON
TRADE MARK



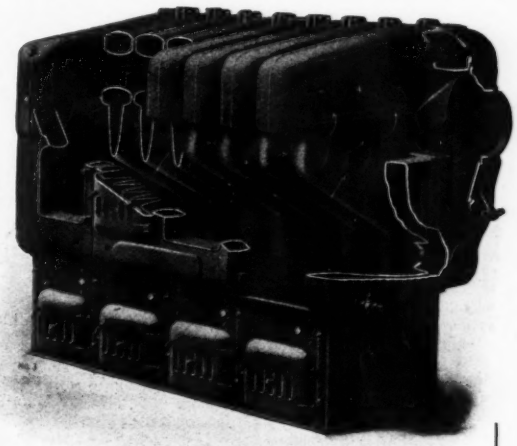
Write for 100 page book, showing how to make lead Joint without caulking lead.

SMOOTH-ON MFG. CO.

JERSEY CITY, N. J.

CHICAGO OFFICE: 61 North Jefferson Street.

Short Grate, Long Fire Travel



BERNHARD BOILERS

are the "Best Boilers Built". They have a short grate and long fire travel. Ask for prices.

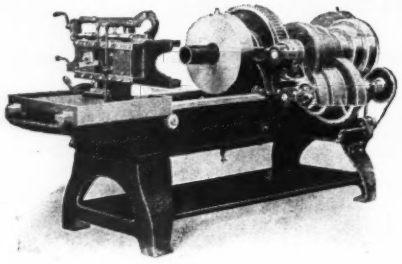
The Garwood Foundry & Machine Co.

GARWOOD, N. J.

Western Representative, Murphy-Dugger-Clark Co., 157 Lake St., Chicago
Boston Representative, The Wm. H. Gallison Co., 36 Oliver Street

MENTION DOMESTIC ENGINEERING

CURIOSITY



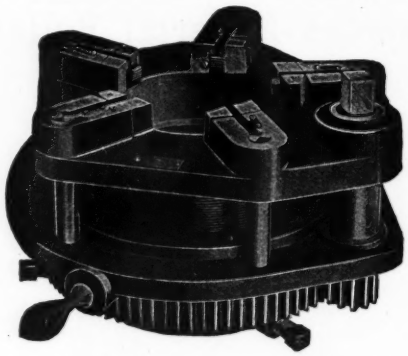
is an indication of THOUGHT and "thoughtful pipers" realize that the best is always

Cheapest in the end

We guarantee the best results from our Power Pipe Cutting and Threading Machines.
Bulletin "A" tells all about them and our free trial offer.

THE BORDEN COMPANY, WARREN, OHIO, U. S. A.

812 Flat Iron Bldg., New York 25 W. Montgomery Ave., Chattanooga



This is our No. 3 Machine. Capacity from 4½ to 8 inch inclusive.

The "Toledo" Pipe Threader

IS DIFFERENT

ONE MAN can EASILY thread any size the tool will take. And they don't cost much. Ask your jobber about it.

Send for descriptive catalogue to

The Toledo Pipe Threading Machine Co.

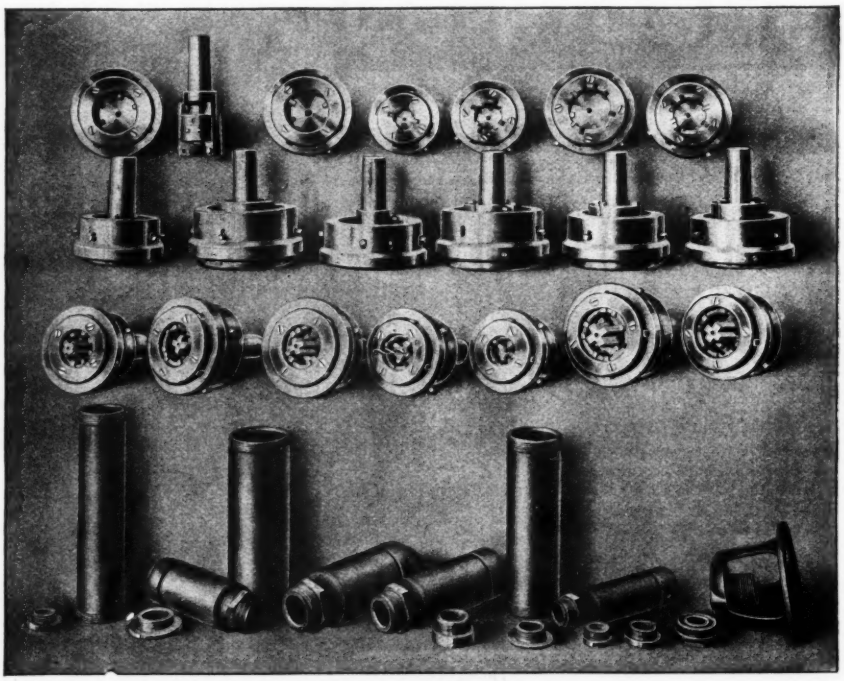
TOLEDO, OHIO, U. S. A.

THESE AUTOMATIC DIES DID THIS WORK

This group of MURCHEY AUTOMATIC-OPENING DIES were designed to finish complete with one operation and one tool, various castings illustrated herewith, and in this tool we combine REAMER, FACING and TURNING tools with AUTOMATIC-OPENING DIE.

Performing all operations with one tool has made it possible to do the work on a special two spindle machine, without reversing or stopping to change tools. The casting is held stationary and combining all operations in one tool makes it possible to do this work in a spindle machine, such as a drill press or tapping machine.

Our catalogue, showing Murchey's automatic collapsing tap and reamer combined, and automatic nipple and threading machinery will be sent upon request.

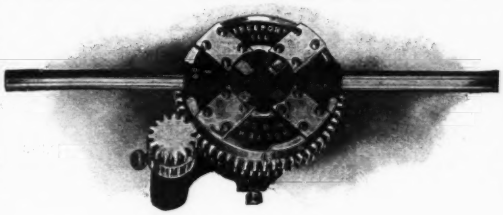


Murchey Machine & Tool Company

DETROIT, MICH.

READ THE ADVERTISEMENTS

Better Results, Less Labor



HOEFER
Adjustable Pipe Threading Machine

Made in three sizes

ONE MAN EASILY WORKS IT.

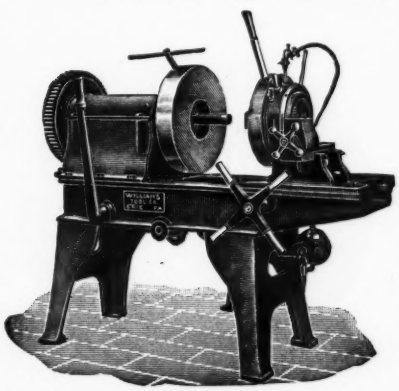
Will cut pipe to a standard taper. Will cut over and under standard sizes. Will cut a running as well as a taper thread. Will cut all sizes of pipe with one set of dies. No changing of dies. No losing of dies. Will cut nipples.

Send for Folder

HOEFER MFG. CO.
FREEPORT, ILLINOIS

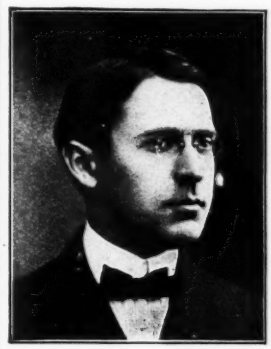
WILLIAMS TOOL CO.

Williams No. 3 Pipe Machine



Is a strong substantial tool that will cut and thread pipe from 1½ inches to 6 inches. It is a rapid worker, is equipped with Quick Opening Adjustable Dies and has six changes of speed without removing or replacing gear. *Send for Circulars and Prices.* We build Pipe Machines cutting from ¼ to 12 inches.

ERIE, PENN.



It's easy to find one or two liars —but do you think I could get all of the fellows listed below to stand up and

LIE FOR ME?

Not on your life—and you boys know it.

Here are a Few

We have thousands of similar letters

Louisville, Ky., May 9, 1906.
We received the Nye Dies recently and take pleasure in stating that they have worked beautifully. We herewith enclose further order. It may be of interest to you to know that we are using these dies on electrical conduit work.
Jos. McWilliams & Co.

St. Louis, Mo., July 4, 1906.
We have found the Nye Dies to be all you claim for them and when in need of pipe dies in the future we shall buy Nye Dies. T. C. Delaney.

Birmingham, Ala., June 22, 1906.
Enclosed find further order for Nye Dies. We are very much pleased with them and shall use no others.
J. M. Haran Plumbing Co.

Bartow, Fla., June 5, 1906.
Enclosed find check for Nye Dies. We are well pleased with them in every way and we have purchased a complete supply of them in various sizes from our jobber.
Bartow Tube & Well Works.

Hamilton, Ont., June 8, 1906.
We received the Nye Dies and are well pleased with them. You may enter our order for another complete set.
J. F. Cummings.

Negaunee, Mich., June 16, 1906.
I herewith hand you further order for Nye Dies. I am greatly pleased with those I received some time ago. T. W. Simcox.

Ridgewood, N. J., May 3, 1906.
Enclosed find check for Nye Dies. They certainly do all you claim for them. We herewith enclose further order.
Jos. H. Christopher,
Contractor.

Philadelphia, Pa., June 6, 1906.
Enclosed find check in settlement of our account for Nye Dies. We have given these dies a very thorough trial and we have found them perfect in every way and all that you claim for them. Kriebel & Co.

As a matter of fact—it cost every one of them and thousands of others real cash paid to me (not them) before they could write me as they did.

I really don't blame you

because you know I make the NYE DIE to sell—I can't use 'em. You naturally say:

"Yes—that's a fine line of talk but it's easy to make a noise with your face."

But listen—

When a whole army of pleased and practical users stand up and tell you

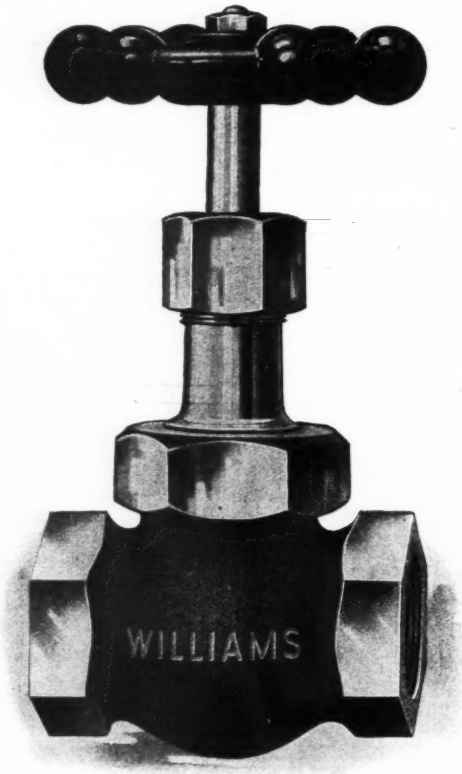
"the Nye Die is the best die on earth"

then you can forget all about me and what I, as its maker, say about it.—Does that sound right? I leave it to you—I believe you're fair. "NYE"

NYE TOOL & MACHINE WORKS
196-198 S. Clinton St. CHICAGO

MENTION DOMESTIC ENGINEERING

VALVES RIGHTLY MADE RIGHTLY SOLD



ARE THE Williams

Send a Sample Order

The D. T. Williams Valve Company, CINCINNATI, OHIO

PITTSBURGH VALVE & FITTINGS CO.

Manufactures and carries in stock a complete line of the following:

Standard Screwed Fittings
Standard Flanged Fittings
Extra Heavy Screwed Fittings
Extra Heavy Flanged Fittings
Long Turn Screwed Fittings
Long Turn Flanged Fittings
Recessed Drainage Fittings
Malleable Iron Fittings
Iron Body Gate Valves
Iron Body Blow-Off Valves
Brass Wedge Gate Valves
Expansion Joints
Steam Traps
Pipe Hangers

WORKS, BARBERTON, OHIO

Address all communications to General Office, Frick Bldg.

PITTSBURGH, PA.

Slip Nipples

ZINC COATED STEEL

Rust-proof; impervious to distilled water; not affected by electrolysis; all true to size; elastic; adaptable to variations in boring castings; for connecting RADIATORS AND HEATING BOILERS positively best method known. SAMPLES FREE to interested persons.

The Pratt Chuck Co., Frankfort, N. Y.

READ THE ADVERTISEMENTS

Bullard Wrenches

Equally efficient on fittings, straight pipe, in corners, against walls, between floors, in ditches or any position where a wrench is called for.

Helps your men out of tight places.

Send for Free Booklet

Bullard Automatic Wrench Co.

Office & Factory: 257 W. Exchange St., Providence, R. I.

"Trimo"

A NEW STYLE

Monkey Wrench

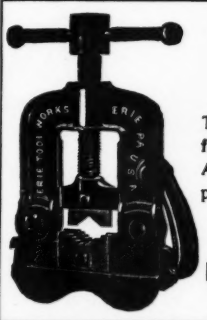
The Mechanical World has long felt the need of a better nut wrench.

Strength greatly in excess of other makes. See U. S. tests. Less *rounding* of nuts. Larger the nut the *longer* the leverage. All drop forged steel, case hardened. Price no greater than the ordinary style.

Let us mail you *Free*, a booklet "Facts are Stubborn Things," giving tests made on the 800,000-lbs. *United States* Testing Machine; also a detailed description of the tool. Will also mail you free catalogue 42 describing the other famous Trimo Tools.

TRIMONT MFG. CO.

55-71 Amory St., Roxbury, Mass., U.S.A



Malleable Iron Pipe Vises

The most complete line of hinged frame malleable pipe vises made. All steel kit pipe vises. Open frame pipe vises.

Jobbing Trade Only

ERIE TOOL WORKS

ERIE, PA.

If a pipe runs close to a wall or ceiling

or in a ditch, when you've no room to swing the handles of your Die Stock, Armstrong's Ratchet Attachment allows you to thread pipe in position. Fits all sizes of Genuine Armstrong Stocks. Every pipe-fitter should have one. Write for prices.

THE ARMSTRONG MFG. CO.
284 Knowlton St., Bridgeport, Ct.

Send 12c in stamps for a sample 2-in. or 20c stamps for 4-in. hanger

STEEL PIPE HANGERS

Can be Cut to all Desired Lengths by Disconnecting the Two Lower Screws

SIZE OF PIPE	½	¾	1	1¼	1½	2	2½	3	3½	4
Adjustable Length 2 to 10 each	.18	.18	.18	.20	.22	.25	.30	.35	.37	.45
Adjustable Length 10 to 16 each	.21	.21	.21	.23	.25	.28	.33	.38	.40	.48
Adjustable Length 16 to 22 each	.24	.24	.24	.26	.28	.31	.36	.41	.43	.51

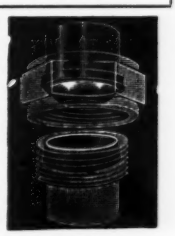
THE REYNOLDS HEATER CO. WARSAW, INDIANA
35 DEARBORN ST., CHICAGO

FF

"Flagg" Malleable Fittings

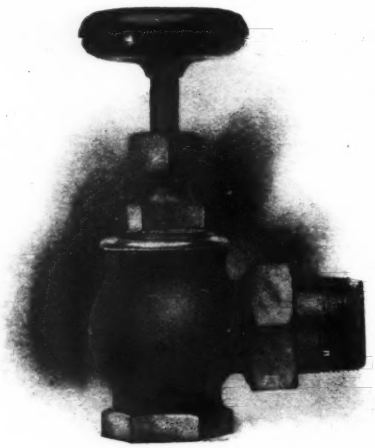
"Flagg" Keystone Unions

THE STANDARD SOFT METAL SEAT UNION



MENTION DOMESTIC ENGINEERING

Steam Radiator Valves



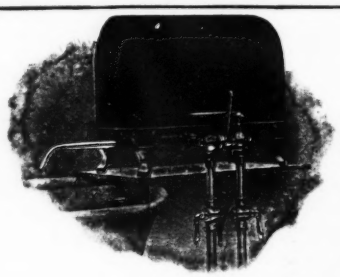
All our valves have Full Water Ways, long Unions and heavy Coupling Nuts. We also manufacture Hot Water Radiator Valves, Gate Valves and Union Elbows.

PEERLESS HEATER & VALVE CO.
DETROIT, MICH.

Eight different styles of floor and ceiling plates ranging in size from 3/8 inch to 8 inches. Carefully finished, all being coppered before nickeling. Send for catalog and prices to the old original company.

***The* Beaton & Corbin Mfg. Co.**
Southington, Conn., U. S. A.

AUXILIARY HEATING SECTION.
is also in use for heater for utilizing exhaust heat of gasoline engines
Anderson-McCutchen Co., Peekskill, N. Y.



The
"ADAM"
Instantaneous
Water Heater

Sold only to the trade. Send for catalogue and discounts.

Manufactured by **Adam's Steel & Wire Works,**
JOLIET, ILLS.

BETTER THAN OTHERS ***Substitute for Sheet Rubber***

Trade Mark Registered
MANGANESITE
MANGANESITE

Will make any joint tight, but is not corrosive. Order a sample of "Manganesite". It will close that baffling leak. **The Erwood Combined Swing Gate Check and Back Pressure Valve is for Steam, Water and Air. Illustrated circular, free**

WALCH & WYETH, 87 East Lake Street, Chicago, Ill.

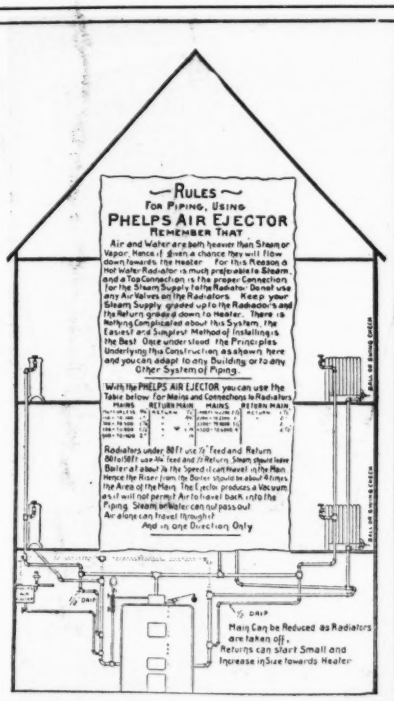
Dean's System of Green House Heating
By Steam or Hot Water

With formulas for obtaining different temperatures. Tables giving radiation necessary per square foot of glass, tables giving glass surface, size of flow and return pipes and much other useful information. Price $2.00 prepaid.

Domestic Engineering, 58-64 N. Jefferson St., Chicago, Ill.

SEND FOR A
Free Sample of Tripp's Pipe Joint Compound
THE ALAN H. TRIPP CO.
'Phone Main 1598 **118-120 Michigan St., Chicago**

READ THE ADVERTISEMENTS


RULES
FOR PIPING, USING
PHELPS AIR EJECTOR
REMEMBER THAT
Main Can be Reduced as Radiators are taken off.
Returns can Start Small and Increase in Size towards Heater

THE PRAIRIE SCHOONER DID ONCE

but where it once labored into the expectant west, a light box run-a-bout now glides serenely on.

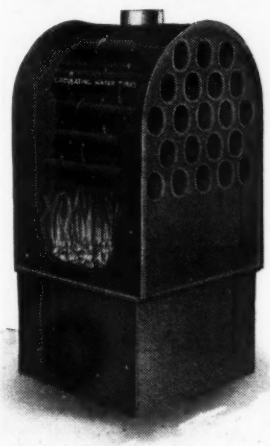
So also has the day of big piping in steam heating work passed by. The **Phelps Ejector** permits the use of much smaller mains, risers and returns and secures better results.

If this is so, you want it, don't you? Our free circular will astonish you.

IDEAL HEATING CO.

OSKALOOSA, IA.

THE LORAIN HEATER



Domestic hot water supply and house heating combined, a feature not found in any other heater.

POINTS OF SUPERIORITY OVER OTHER HEATERS

Coal, gas or wood used for fuel.

Can be changed from gas to coal instantly without removing burners.

Simple in construction.

Occupies little space. Can be set in 5 ft. basement.

Heater is made of cast iron and portable set. No joints in the fire. Shipped with all connections for flow and return pipes. No expansion tank. Reducing pressure valve connects heater with the city water direct, thus insuring a uniform pressure and an unlimited supply of hot water.

The Lorain Heating & Supply Co.

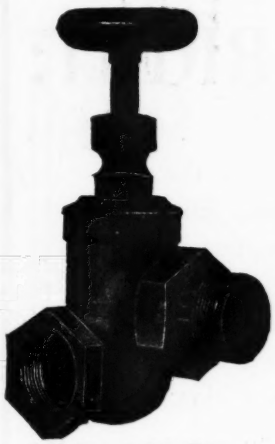
WRITE FOR PROPOSITION. LORAIN, OHIO

Yes, we make the best Round Boiler offered to the trade up to date. Write us for what there is on the inside.

Prudential Heating Co., Akron, O.

MENTION DOMESTIC ENGINEERING

READ THF ADVERTISEMENTS



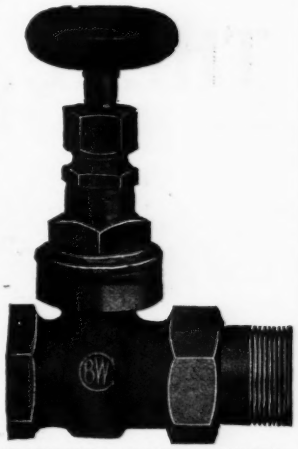
Union Corner Radiator Valve

Improved Steam and Hot Water Radiator Valves

Union Elbows

Air Valves

Standard and Union Gate Valves



Straight-Way Valve, Double Gate with Union.

All goods are thoroughly tested and inspected before shipment.

CAPITOL BRASS WORKS

DETROIT, MICH.

The Very Essence

of expert knowledge—the boiled-down results of hundreds of careful experiments—the combined lessons of scientific study and actual practice—are contained in

NOTES ON

Heating and Ventilation

BY

John R. Allen

Junior Professor of Mechanical Engineering
University of Michigan.

This book treats especially of the design and installation of Heating and Ventilating Systems with reference to ***efficiency and economy in operation.*** The matter on every page is based on actual laboratory experiment and the actual experience of the author in the field of engineering practice

The initial edition of this splendid book is small So send your orders in **now.** It is carefully and fully illustrated, printed on high grade paper and bound in beautiful cloth. The price is only $2.00.

DOMESTIC ENGINEERING

Desk C, 58 North Jefferson Street, Chicago, Ill.

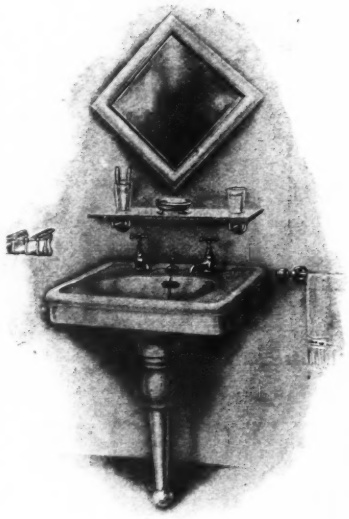
WHAT MORE need be said than that the Herbert Garbage Burning Water Heater has proved itself equal to all our expectancies? Write for information.

Herbert Boiler Co.

240 Root Street, Chicago, Ill.

MENTION DOMESTIC ENGINEERING

THERE IS ONLY ONE RIGHT:



Because of its nature china is the right thing to use for lavatories. Enameled iron answers the purpose, but poorly; an imitation is never as good as the original. For elegance, cleanliness, comfort and convenience use our new vitreous earthenware lavatories; they are perfection.

FORT PITT Supply Co PITTSBURG PENN.

We also carry an immense stock of Plumbers' Supplies ready to ship at a minute's notice.

FORT PITT Supply Co PITTSBURG PENN.

GOOD advertising is nothing more or less than the talk of a good, first-class salesman, not to one individual, but to each individual of a mass. One kind of salesman takes his time to carefully detail the merits of the goods he has to sell and makes his talk verbally to one customer, while the same amount of energy, thought, salesman ability and convincing argument would win perhaps a thousand people if told through the columns of the newspapers.—C. W. Post, in "Fame".

THE WATER WAY

BETWEEN

DETROIT AND BUFFALO

The D. & B. Line Steamers leave Detroit weekdays at 5:00 p.m., Sundays at 4:00 p. m. (central time) and from Buffalo daily at 5:30 p. m. (eastern time) reaching their destination the next morning. Direct connections with early morning trains. Lowest rates and superior service to all points east. Popular week end excursions to Buffalo and Niagara Falls leave Detroit every Saturday and return Monday morning.

RAIL TICKETS AVAILABLE ON STEAMERS

All classes of tickets sold reading via Michigan Central, Wabash and Grand Trunk railways between Detroit and Buffalo in either direction will be accepted for transportation on D. & B. Line Steamers. Send 2c. stamp for illustrated pamphlet. Address: A. A. SCHANTZ, Gen. Supt. & P. T. M.

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QUEEN & CRESCENT ROUTE

and

Southern Ry.

From Cincinnati to all Important Cities South, Southwest and Southeast.

Reduced rates on the first and third Tuesdays of each month.

For information address

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READ THE ADVERTISEMENTS

No Trust Can Beat It

If you start slowly and gradually develop a **Central Station Heating Plant** you will have a profitable business, one you understand and can manage, and be free from competition. Write for our free book "District Steam Heating" as a starter. It tells you how to proceed

American District Steam Co.

Main Office: Lockport, N. Y. Western Office: Monadnock Bldg., Chicago

MUCH of the satisfaction resulting from the use of the "Humber" Hot Water Heater is due to its simplicity of construction. Few parts—and every part treated as a special feature.

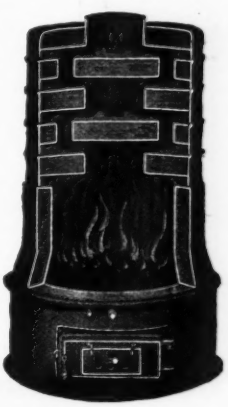
To Explain

Easy to Sell

Easy to Understand

Easy to Operate

and we think this explains why it is easy to sell so many of them. Positive and rapid circulation. More grate and fire surface than it needs to carry the listed ratings, but that is the way we make all our boilers and radiators—a little better than seems necessary. This sort of business practice on our part, does not hurt the fitter a bit. All styles and sizes Hot Water and Steam Boilers, "Seneca" Radiators for both Steam and Water.



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WORKS AND GENERAL OFFICE, CANTON, OHIO.

Branches: New York, Cleveland, Indianapolis. Crane Company, Selling Agents.

MENTION DOMESTIC ENGINEERING

The "Peer" Water Heater

is unquestionably the pinnacle of perfection in its line. It is a self-contained heating range boiler stand, that will furnish hot water in one minute and a hot bath quickly for less than two cents, 75 per cent cheaper if natural gas is used. The tank can be heated from top to bottom with only 20 ft. of gas.—Can you beat this ?

WRITE FOR AGENCY

The Peer Water Heater Company

39 STATE STREET

CHICAGO

SICKNESS In the house—Hot Water Needed — "Turn the Faucet" and Hot Water comes — all you can use. In sickness or health the "Ruud" Automatic Gas Water Heater fills the bill. Greatest invention of the day — 100 gallons Hot Water for 10 cents (artificial gas) Call and see it.

Ruud Mfg. Co.
PITTSBURG, PA.
Branches in all large cities

Hot Water Season Coming

The water-backs and auxiliary coils will soon be out of business and you must prepare to serve your customers with hot water heaters which are automatic, never off duty, limitless in furnishing supply, and cheap as to cost of fuel.

The Niagara Automatic Water Heater

will be a great seller. Uses Natural or Artificial Gas.

SEND FOR BOOKLET

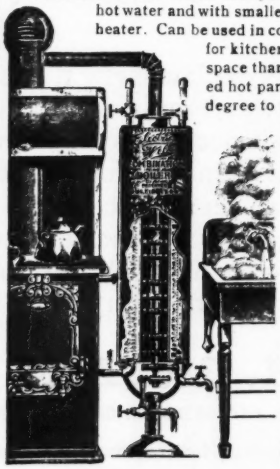
DIRECT ALL COMMUNICATIONS TO

Hammond-Homberger Co.
SILVER CREEK, N. Y.

Electric Weld Combination Boiler and Heater

(Deasy Patent)

Can be used for any purpose where it is desirable to heat water by gas, and moreover is the best for that particular purpose. It gives MORE hot water and with smaller gas consumption than any other heater. Can be used in combination with Range Water Back for kitchen installation. Takes up no more space than ordinary Range Boiler. No exposed hot parts (Note that). Does not add one degree to temperature of room. (Note this too as these points are exclusive with this heater.) No coils to clog up and renew. Complete absorption by the water of all the heat in the gas. Made in any size for basement installation, in combination with furnace and with thermostatic control. Best installation on the market for Flats or Public Buildings. Hundreds of enthusiastic users If the trade mark "Electric Weld" is not sufficient guarantee this Heater is all that is claimed, write us for PROOF. **It will pay you Mr. Plumber to know more of this—your customers will thank you.** Handled by Jobbers of Plumbing Supplies. Made in sizes from 30 gallons to 250 gallons.



JOHN WOOD MFG. CO., Conshohocken Pa.

READ THE ADVERTISEMENTS

ALL THE TRADE

SHOULD HANDLE

The Powers Heat Regulators

FOR

Hot Air Furnaces

Low Pressure Steam

Hot Water Boilers

Hot Water Tanks, etc.

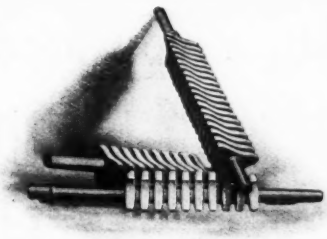
Simple Automatic Reliable

The Money Makers

THE POWERS REGULATOR CO.

40 Dearborn Street, CHICAGO

111 Fifth Avenue, NEW YORK



This Grate and the "Burnham" Boiler

It's on the same principle as your kitchen range grate—only a bigger thing, done in a bigger way, to do bigger things—then there's another difference in the way the rotary wheels fasten on the grate shaft—No shaft pins to slip out—no slipping around of wheel—you're always sure it's sure.

This is Burnham's kind—the kind of grate that goes into the jointless boiler—the boiler with all fire surfaces water surrounded. Send for catalog.

LORD & BURNHAM CO.

IRVINGTON, N. Y.

Boston; 818 Tremont Building. Phila.; Keystone Supply & Mfg. Co. Chicago; Chicago Heater & Supply Co. Providence; Allen & Reed, Inc. Minneapolis; Roberts Heating & Ventilating Co.

You Want This Book

because it is a *practical* book—because it will show you how to do *better work*—because it will *put money down in your pants pocket.*

Notes on Heating and Ventilation

By JOHN R. ALLEN
Junior Professor of Mechanical Engineering
University of Michigan

contains *the very essence of expert knowledge—the boiled-down results of hundreds of experiments*—that vital, practical, *dollars-and-cents* kind of teaching that you can't get except by combining scientific study with actual practice.

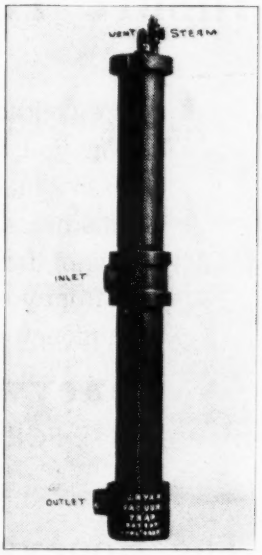
There is no better authority on *Heating and Ventilation* than Prof. Allen. He is recognized as a master of these subjects. And you get the condensed results of *all* his study, and *all* his experiment and *all* his actual work in the engineering field **for only $2.** You can't be a first-class, up-to-date man unless you make the knowledge in this book yours.

Tear out this page, write your name and address on the margin and mail it with a $2 bill *at our risk. Do it now.*

Domestic Engineering

Desk C, 58 N. Jefferson St., CHICAGO

VACUUM HEATING

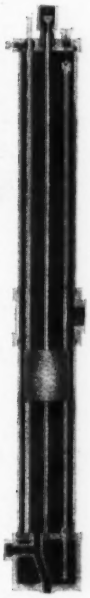


is the coming

System

I have one

that works



Write for Booklet "A"

E. J. Ryan

117 Walnut Street
Danville, Ill.

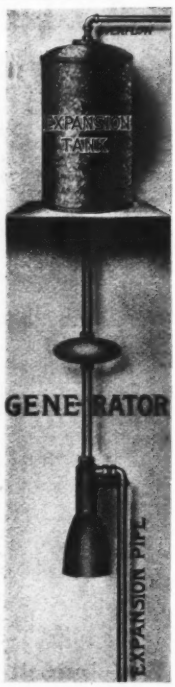
When you need a Steam Trap at all

You need the best.

A STEAM TRAP THAT KEEPS ITSELF CLEAN.

That doesn't mean to pay a high price—necessarily. It does mean you must discriminate. Take the "ECLIPSE" STEAM TRAP. It is a continuous flow trap. Works equally well with high or low pressure. Simply constructed and taken apart quickly. The working parts are attached to the cover—easily accessible. The strainer prevents dirt and scale from entering and interfering with uniform operation. The entire adjustment is perfect—the valves are perfectly balanced and the discharge is continuous as long as there is any condensation. The float is tested—the entire trap is tested before it leaves our shop and it must be and is in first class condition. This is the one really reliable trap at a price that does not seem like robbery—and it's as good as it is cheap.

THE JOHN DAVIS COMPANY
HALSTED 22ND AND UNION STS - CHICAGO



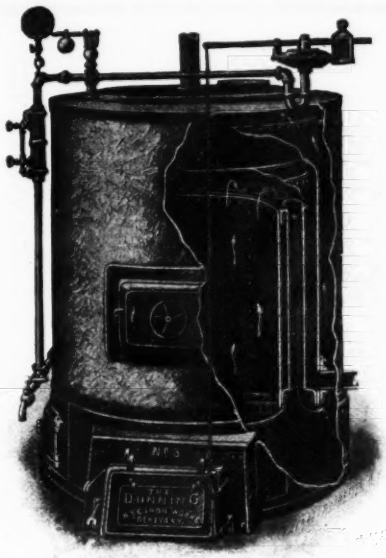
Insure Your Hot Water Jobs

Insure (without cost) every job of Hot Water heating you install, against sluggish circulation, excessive fuel consumption, slowness to heat in the mornings, failure to heat in extreme weather, boiling of the water, etc. You pay for the insurance from your saving in cost of installation, and have money left besides. You can do it with the

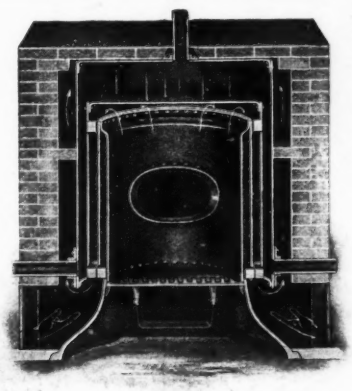
Honeywell Heat Generator

WRITE FOR FULL PARTICULARS AND PRICES

The Honeywell Heating Specialty Co.
WABASH, IND.



Regular Portable Steam Style (Also made for water)



New Dunning Brick Set Steam Style (Also made for water)

Club Portable Heater for Water (Also made for steam)

MORE OF OUR LINE

BOILERS

For all Purposes
In all Places

Made of tested steel, Siemans-Martin (open hearth) process, upon specifications and requirements of the U. S. War and Navy Departments and used by them quite generally. ¶ Steel is tough, strong, ductile, elastic, and malleable, and **cannot crack.** The cracked section is the nightmare of the cast-iron boiler. Write for our catalogue. : : :

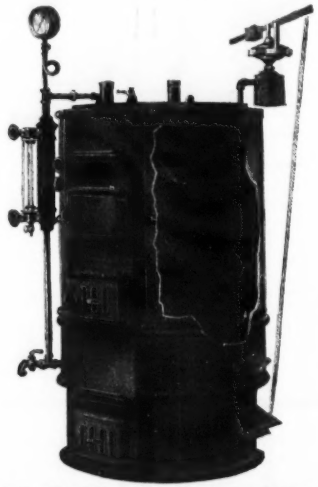
New York Central Iron Works Company
GENEVA, NEW YORK

READ THE ADVERTISEMENTS

All Of The Same Stripe

ARGUMENT

The steamfitter who is looked up to in the community is the one whose work in every job bears the same genuine stripe of first-class workmanship, and whose wisdom has taught him to handle goods only of the same high class quality.



The "Soleil" Boiler for Steam Heating

PROOF

Our Boilers and Radiators made from the best run of gray iron, every inch of every section of uniform thickness sound and strong, every part of perfect workmanship, make them Standard Examples, "all of the same stripe". Do your work with our goods.

GET THE FACTS==Send for our handsome catalogs

Kellogg-Mackay-Cameron Co.

Boilers, Radiators, Heating and Plumbing Supplies

General Office, - CHICAGO

MINNEAPOLIS *SEATTLE* *KANSAS CITY*

Pick Out A Manufacturer

ASK HIM:

HOW many feet of uncovered two inch pipe do you imagine you have in you mill?

That is, pipe carrying eighty pounds of steam pressure or more.

Here's something that may interest you about these nude pipes.

Take a hundred feet. Size two inches.

Apply Norristown pipe covering.

'Twill cost around $24.00.

But 'twill save him $32.00.

Paid for, and more too, in one year.

Now a little arithmetic.

Just for curiosity why not see how many units of one hundred feet there are.

Each one with these conditions will show the same results.

So it's a mere matter of multiplication.

Only, two inch pipe is not so very large.

The larger the pipes, the more they are radiating in the same length.

Would you be interested in an estimate?

Either on the material;

Or all applied?

Write us for free samples and prices and we will tell you how you can make big money on this work.

NORRISTOWN COVERING CO.

NORRISTOWN, PA.

Representatives of the Norristown Covering Company

E. Curtis, Boston, Mass.
John R. Livezey, Philadelphia, Pa.
John R. Livezey, Washington, D. C.
Phelps Bros., New York, N. Y.
Chicago Heater & Supply Co., 56-58 Dearborn Street, Chicago, Ill.

WESTERN TUBE CO.
KEWANEE, ILL. U. S. A.

THE ordinary pipe hanger must be adjusted before the fittings are connected to the pipe. If it is later found that the weight of the fittings causes the pipe to sag, necessitating more hangers, they cannot be attached without disconnecting the pipe.

The **Western Expansion Pipe Hanger,** here shown, avoids this trouble. These hangers can be attached at any time. You can run a line of pipe by making use of temporary supports, and when in proper line the hangers may be adjusted. They are simple and inexpensive.

Send for Specialty Catalogue No. 1, describing this and other improvements. If you enclose ten cents to help pay shipping charges, a sample 1" Western Pipe Hanger will be sent you without charge.

WESTERN TUBE CO., Kewanee, Illinois

This Advertisement

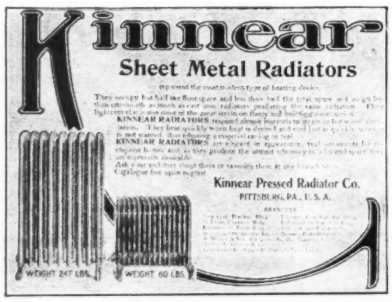
is an exact reproduction of our half page announcement appearing in the July issues of the following magazines: McClure's, Review of Reviews, Country Life, American Homes & Gardens and House Beautiful.

¶ The aggregate circulation of these magazines is enormous. It means that owners of buildings all over the country will become interested in KINNEAR PRESSED RADIATORS, the most modern type of heating appliance.

¶ You should be in position not only to explain the merits of KINNEAR RADIATORS but to install them whenever possible.

¶ It means money in your pocket and satisfaction for your customers.

¶ Write Dept. 3 for illustrated catalogue and circulars.



The Kinnear Pressed Radiator Co.
PITTSBURGH, PA., U.S.A.

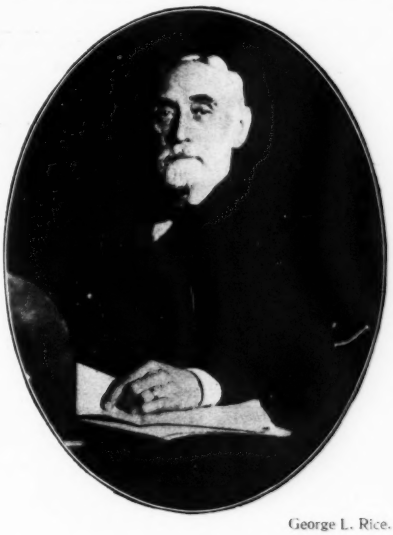
BRANCHES:

New York, Flatiron Bldg.
Chicago, First National Bank Bldg.
St. Louis, Chemical Bldg.
Kansas City, Heist Bldg.
Toronto, Ont., 302 Queen St.
Seattle, 408 Occidental Ave.
Indianapolis, State Life Bldg.
Oakland, 922 Franklin St.
Detroit, Buhl Bldg.
San Antonio, Moore Bldg.
London, England, 19-21 Tower St., Upper St. Martin's Lane.

READ THE ADVERTISEMENTS

Edward H. Rice.

For More Than Fifty Years



George L. Rice.

The case of the two brothers, Edward H. and George L. Rice, who have been in the employ of the Walworth Manufacturing Company, of Boston, under its different names for over fifty consecutive years, is interesting to employer and employee alike; not only because of the loyalty and faithfulness so strongly demonstrated, but because it is quite improbable that the records of any other concern can produce a case in any degree similar.

On the 19th of October, 1854, Edward H. Rice, then fourteen years of age, applied for a position as office boy with J. J. Walworth & Co. The fact that he expressed his desire to begin whatever duties might be assigned to him at the earliest possible moment apparently won for him the good wishes and approval of his future employer, and he was at once told to hang up his hat and hold himself in readiness for further instructions, being notified that he would receive a salary of $100 a year.

At that time young Master Rice was one of an office force of three, the others being a bookkeeper and an assistant bookkeeper. In April, 1855, Mr. Rice learned that the assistant bookkeeper was to leave the Walworth Company, and suggested to his older brother, George L. Rice, who at that time was employed by a wholesale drug house, that he apply for the position soon to be open. George L. Rice did as suggested and was given the desired position at a salary of $450 a year. The two brothers proved themselves to be industrious and interested in the welfare of the concern for which they worked, and were advanced to higher and more responsible duties as they presented themselves.

In the early sixties some of the firm members became interested in the manufacture of malleable iron pipe fittings, buying the plant and equipment of the Malleable Iron Fittings Company at Branford, Conn. Edward H. Rice was sent to Branford in 1864 as the local representative of the Malleable Iron Fittings Company, and for a number of months acted in the capacity of paymaster, time-keeper and weight checker. Having stayed in Branford until the confusion incident to the transfer of the property had been adjusted, he returned to Boston to assume his duties in the home office.

Between the years 1870 and 1880, Edward H. Rice did some traveling through the central west in the interests of the Walworth Manufacturing Company, but as work in the home office was more congenial to him, he was relieved of his traveling duties, and was retained in Boston, where he now has charge of the pipe department of his company.

George L. Rice has remained continually in the accounting department of the company, and now occupies the position of assistant cashier and corporation clerk.

As a fitting testimonial of the high esteem in which Edw. H. Rice is held by his fellow employees, the day of his fiftieth anniversary with the company was chosen for the presentation to him of a large silver loving cup. The gentleman chosen by his colleagues to present the cup addressed some suitable and appropriate remarks to Mr. Rice, to which he replied in kind. The directors of the company took advantage of this day as being well suited for an expression of their appreciation of the faithful and loyal services of Mr. Rice, by sending to him at his home a large hall clock. The gift of the clock as well as that of the loving cup were in the nature of surprises to Mr. Rice, and it is with a very pardonable degree of pride that he relates the happiness he feels in their possession, and the cause of their having been given to him.

George L. Rice celebrated his fiftieth anniversary with the company on the first day of May, 1905. As in the case of his brother he was appropriately remembered on this day by receiving from the directors and many men employed in the company's offices a large silver loving cup.

It is gratifying to know that each of the two brothers is actively engaged in the work of the company, and each is in robust health, indicating that they will continue to engage in the pursuit of their duties for many years to come.

Sunray Boilers and Roman Radiators

Represent the highest type of construction. Prices are right. Prompt shipments can be made from four different points.

THE J. L. MOTT IRON WORKS

BOSTON NEW YORK CHICAGO

Investigations

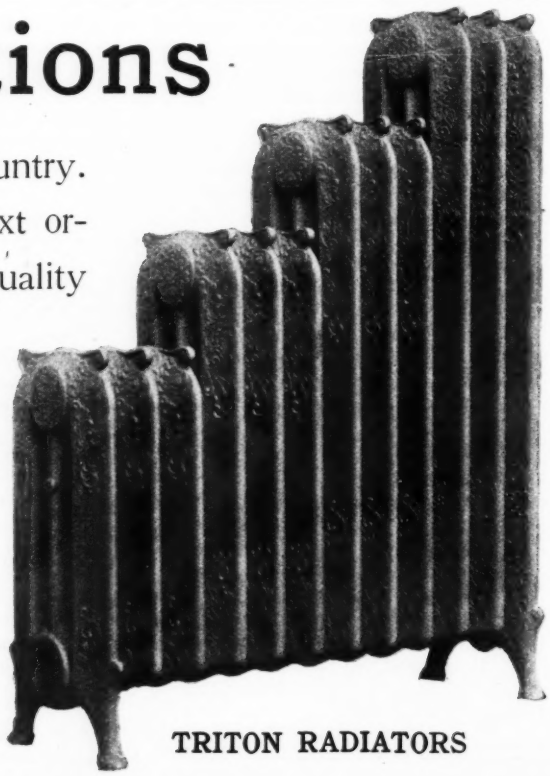
are a good thing for the country. Before you decide upon your next order for radiation, look into the quality of **TRITON RADIATORS; they** will bear investigation. Send for our new catalogues, just out.

United States Radiator Co.

DUNKIRK, N. Y.

BRANCHES:
New York Washington
Chicago Minneapolis

WAREHOUSES:
Jersey City
Minneapolis



TRITON RADIATORS

DOMESTIC ENGINEERING

PLUMBING HEATING LIGHTING MILL SUPPLIES

Weekly: $1 a Year. Chicago, Saturday, July 21, 1906. Whole No. 710. Vol. XXXVI. No. 3.

Should a Master Plumber Handle Tools of Trade?*

By DAVID WHITEFORD, Chicago.

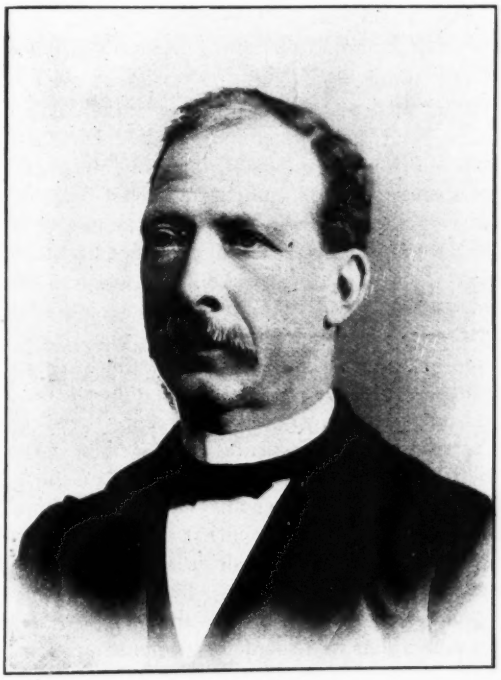
AMIDST the various organizations of commercial and industrial life the National Association of Master Plumbers of the United States of America stands as a true representative organization of the life and vigor of its people.

We are now entering the twenty-fourth year of our existence, and turning our thoughts backward through the years of the past we remember with pleasure and interest the forward movement of the plumber. Through our efforts for the welfare of the people's health and preservation of their lives, we have lifted ourselves up and placed ourselves on a level of progress with the latest and most advanced discoveries of the age. They who can grapple with the enemy Death through sanitary skill and can lessen his destructive powers are real benefactors to their race, have won a great and glorious victory for the world, and it is for us to continue to unfold great and vital problems along the same progressive line.

There are many problems which have arisen within these years that are of supreme importance to us in the industrial world. It is for us individually and collectively to see how we stand in regard to our future interest in relation to our part of the profits and losses as business men, whether we are receiving our proportion of the money due us in the building trades, whether with all the opportunities that lay in our pathway we have made the most of them and taken advantage of the protection and legislation that our association has made possible for us. While there is no necessity for the outcry of poverty within our ranks, the vast majority of us are running behind in the race for wealth.

If we grasp the situation properly, there is a danger point standing out threatening to reduce the income of the vast majority of legitimate master plumbers in the larger cities of the country.

The master plumber is increasing rapidly far beyond a healthy demand and the journeyman plumber and gas fitter are becoming fewer and



David Whiteford.

fewer and greatly in demand. The ratio of master plumbers is out of all due proportion to the journeyman. In 1863 to 1865, there were in Chicago 10 to 15 master plumbers to 75 to 100 journeymen plumbers. Today I am informed that in Chicago there are almost a thousand mas-

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ters, great and small, to about 1,200 journeymen, and the relative amount of work for a plumber of the long ago was as great as the amount of work for a plumber of today, and the oft-quoted statement that the man of the past was not as good a mechanic as the man of today is wrong, and cannot be supported. While they did not know much of the ventilation and reventilation, it was through their initiative and gradual unfolding that these discoveries became a fact. They are living today who knew in the '60s that vacuum and syphonage could be remedied by vent of air.

Now, with these few historical introductory remarks, I will take up the subject assigned to the State of Illinois by your Committee on Essays, namely, "Should a Master Plumber Handle the Tools of Trade?" In attempting to write an article on this subject I am well ware of the difficulty that confronts me, and if I fail in my efforts to uphold my statements it is because of the many sides to the question and different viewpoints which can be presented for and against the master plumber handling the tools of trade.

The question as it appears to me at the outset is what makes a master plumber? How came he to be such? I will confine myself as much as possible to the question, drawing from other sources by way of comparison what may be at my command and convenient for my purpose. In the Declaration of the Independence of the thirteen United States of America we find these words, "We hold these truths to be self-evident that all men are created equal. That they are endowed by their Creator with certain inalienable rights; that among these are life, liberty and the pursuit of happiness. That to secure these rights governments are instituted among men deriving their just powers from the consent of the governed. That whenever any form of government is destructive to these ends it is the right of the people to alter or abolish it and to institute a new government."

While the National Association of Master Plumbers has not made a declaration that all men affiliated with it as members should have learned the trade and be able to handle tools, it is conceded he should possess sufficient knowledge of the trade to conduct his business for his own good and for all others engaged in the business, and for the best good of all the people he serves and the health of the community.

The method for the education of the apprentices of the past is passed and never likely to return, and could not exist under our present economic system. That is to say, the boy was bound by articles of agreement for a term of years and was taught the simplest essentials and technic of the trade, or, as Shakespeare has it: "I will teach him my trade." It is by the education and selection of the boy that the standards of men and masters are to be maintained, and in order to accomplish this it is essential that the young man have the necessary school education to fit him for any trade or business calling.

The present method of instructing the apprentice plumber (outside of the plumbing trade school, is by helping the journeyman, and this is the only true method with the additional training of the trade school. It is to be regretted, however, that the master plumber of today throughout the greatest part of our country cannot or does not control the selection of apprentices, and by association rules the possible number and the terms of years of service, their examination and certificate of proficiency to indicate that they can and are entitled to handle tools of trade. If the premises as set forth above are correct as to who can handle tools, then it naturally follows that he only should handle tools of trade.

The State Legislature of many States has passed laws enabling the municipality to enforce the examination of both journeymen and master plumbers and those who desire to go into the business for themselves. If they pass an examination and meet all the requirements and open shop they are then denominated Master Plumbers.

Now as to the question, "Should this man handle tools of trade?" I may answer "Yes" and I may answer "No." You see here is a paradox and how am I to get out of the dilemma?

Let us take up the master plumber who has become such through the regular course of training and worked years as a journeyman and could always command the highest wages. It would appear on the face of it there would be no necessity for this man to become a master in order to work with tools. He can make $4.50 per day of eight hours with nothing to trouble him, plenty of work, and get his money every week. It seems to me his only desire and object to become a business man in every sense of the word to conduct the plumbing business as it should be done, his time would be entirely taken up in

soliciting, figuring and attending to all the details consequent upon a successful business career. If he is to maintain his own and establish himself in the confidence of the people he must superintend the work personally to get a reputation and make money. I am reminded (and it is not out of place to tell it) of one of Chicago's oldest master plumbers' answer to one of his customers when he was called in question for figuring his work so high. He had a figure from another plumber and it was much below his estimate. His reply was that the other man was figuring for a reputation, while he had his. Reputation does not always make money, but it is a right good thing to have.

Then, again, under this same classification of master plumbers may be found men who have worked for years as journeymen, who became restless and discontented on account of strikes, lockouts, etc., who wanted a place of their own thinking they would be freed from unions and confederations of unions. Though these men have never made a great showing in the business world, nevertheless they have and are doing a conservative and careful business and are not a hindrance but a help to the interests of other men engaged in the plumbing trade, although at times they may handle tools of trade.

Again, does the examination and certificate of a man to engage in the business of plumbing as a master make him such? I say "No." Who do we find among them? I could mention a dozen in my own neighborhood who, to be placed correctly, are not plumbers, and how they ever got a license to handle tools I cannot say. These same men could not get $10 per week in the employ of any man doing plumbing work, and yet they have the badge of authority to do work by handling tools. As a master plumber they are deceiving the people and the public eye cannot detect them, and they live and thrive in their own way to the detriment of public health and the interest of the plumbing fraternity. These men should not handle tools of trade, and why? These men, remember, are employed in repair work altogether. Now decayed and wornout plumbing requires skilled workmen. Twenty-five per cent of this repair work is done by these men (I am speaking of large cities), and that is about the only class of work they do, except sometimes they will install a sink or other fixture without proper trap and ventilation. This is hidden work which is difficult to detect and seldom, if ever, their work is reported for inspection. They seem to have become a necessity to the real estate dealer and owner of cheap buildings. He is willing to join hands in doing a little work in as bad a manner as can be, patching where it cannot be patched, cementing and puttying holes in any old way. This is an evil and it must be stopped, and with concerted action by our local and National Association we will drive the rascals out.

Note another class of master plumbers handling tools of trade. Not for his own interests but for the benefit of some contracting builder or speculator whose whole object in letting contracts is to get the work done far below a fair profit to the plumber who has no capital but his labor. He makes himself a tool to this man who promises to pay his bill for material by becoming security to the supply house for goods that enter into the plumbing work, and whatever may be left the plumber may be fortunate if he gets it. This is another evil in our trade, and it would be much better for our business if such a man could be eliminated as a competitor by insisting that he should go back to the ranks as a journeyman, where he properly belongs.

Then, again and last, as I said in the beginning, that while we as a National Association have never declared that a master should be able to handle tools, and I think should not so declare, I am free to confess that there are men now engaged in the business who cannot and do not need to handle tools of trade but who by years of association and contact with all the details of the trade have become familiar with all its requirements, can figure on work and who, by address and fitness in the social and business world, are greatly to be preferred as master plumbers to many so-called practical plumbers that are engaged in the business.

In conclusion, in presenting these few thoughts on a subject which is of interest to the trade I trust that the same spirit of fellowship and magnanimity which has followed all our deliberations may continue, and if there is anything of value in what has been said, anything that will aid in our mission of love for the brotherhood of man and remove obstacles that may stand in the way of progress, we will have accomplished a purpose of lasting good to ourselves and all humanity.

The Elimination of Redundant Parts in the Forced Circulation of Hot Water*

By A. H. BARKER, Trowbridge, England

THE system described in the present paper is the outcome of an attempt to utilize two of the properties of steam which chiefly make up its value to the heating engineer—viz., its latent heat and its pressure—in such a way as to eliminate the redundant parts of a pump-circulated hot-water apparatus of the ordinary type.

The standard method of heating water by steam and circulating it, is to use a calorifier or steam-tube heater, and to propel the heated water by means of a duplex pump. If this combination is analyzed into its elements it will be seen that there are several parts which are functionally redundant, and which, therefore, if for no other reason (of which, however, there are many), ought to be dispensed with.

In the heating of the water, for instance, the essential requirement is to transfer the heat of the steam to the circulating water as quickly as possible. In the ordinary method the surface of a metal tube is interposed between the heat of the steam and the water, and all the heat communicated to the water must be conducted through the surface of this metal tube. When we come to inquire into the fundamental reason for the use of this tube, it will be clear that it is not required for the primary purpose of conducting the heat of the steam to the water, because this process will take place much more quickly and efficiently without any tube being interposed. Neither is it required primarily for the purpose of keeping separate the water of condensation from the heated water, for (except in the case of water heated for domestic hot-water supply, in which case the water on the two sides of the tube surface is different in quality, one being hard and the other soft) there exists no reason why the condensed water should be kept separate from the circulating water.

The really fundamental reason for the use of the tube between the water and steam is not that it is a device for filtering the heat of the steam away from the condensed water, but for filtering the heat of the steam away from the pressure of the steam, if I may be allowed to use such an expression. In other words, the tube interposed between the water and the steam has as its necessary qualifications for its duty (1) the thermal conductivity necessary to allow the heat to pass, and (2) the mechanical strength necessary to retain the steam and to resist the difference in pressure between the water and the steam.

If you have steam at different pressures the heat of which is to be communicated to the same circulating water, it is for the same reason necessary either to reduce the pressure of the higher to the same value as that of the lower, if using only one tube heater, or to use a separate tube heater for each different pressure employed.

There is in the tube-heater system yet another redundant part. When the heat has been filtered out of the steam, the steam itself disappears as steam, and a certain amount of condensed water takes its place. This water must be got rid of somehow, otherwise it will prevent the access of more steam to the heating surface. It must be either returned to the boiler as feed water or thrown away, and here again the existence in this condensed water of both heat and pressure together introduces another set of problems. This water is often at a temperature far above that at which it can exist as water at the atmospheric pressure, and the necessary requirement is to return this water to the boiler as directly as possible, with as little loss of its heat as may be.

The standard or usual method in which this problem is solved is to use a steam trap which is functionally a device for filtering the water away from the steam, which, if it is efficient, drains out the water from the steam without allowing the escape of any steam as such, and returning the condensed water for feed purposes to the boiler chamber at atmospheric pressure. When the water is first transferred by the trap from the pressure of the steam to the atmospheric pressure, its temperature and pressure are such that a portion of it instantaneously explodes into steam, thereby reducing the temperature of the remainder to such an extent that it can exist as water at the atmospheric pressure. By this process some of the heat of the condensed water is deliberately wasted in order to secure the easy transference of the water freed from pressure, as water, again to the boiler, or, it may be, to the drain.

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From this point of view, therefore, the steam trap is seen to be merely a somewhat clumsy device for dealing with the pressure of condensed water and reducing it to the atmospheric pressure by a process of wasting part of its heat.

It will thus be clear that the heating tube of the calorifier and the steam trap are introduced into a heating system solely on account of the necessity of equalizing the various pressures as between the static head of the circulating water on the one hand, the boiler pressure on the other and the atmospheric pressure on the third.

The next series of redundant parts in this system are found in the pump.

The primary function of the pump is to utilize the pressure of the boiler steam in order to press the heated water round the circuit of pipes. Functionally the method by which this result is secured is to place two check valves in series in the water circuit so that the water can only travel one way round. The water space between these two check valves is arranged so that it can continuously be alternately expanded and contracted. Thus water is drawn from the return pipe of the system and delivered into the flow pipe. At some point of the system the heater is fixed for maintaining the temperature.

The method of securing the alternate expansion and contraction of the portion of the circuit between the two check valves, is a water piston and cylinder actuated by a steam piston and cylinder.

Now just as there exists no reason other than the difference in pressures why the water should not be heated by direct contact with the heat of steam without the interposition of a tube, just so there exists no reason, except the difference of temperature, why the pressure of the steam should not be communicated direct to the water without the interposition of two pistons and a piston rod, and all that they entail in the way of glands, guides, stuffing boxes, etc.

Functionally the reason for the existence of a pump is the exact opposite of that which justifies the calorifier tube. For, whereas the calorifier tube is a means of communicating the heat of the steam to the water without at the same time communicating its pressure, by interposing the substance of a tube between the two, just so the pump is a means for communicating some of the pressure of the steam to the water without at the same time communicating its heat. It does this by interposing two pistons and a piston rod, or pump plunger or its equivalent, between the steam and the water. It is important to notice that both the pump and the calorifier are in reality filters for filtering the heat of the steam away from its pressure. They do this in an opposite sense, the calorifier using the heat and rejecting the pressure, and the pump using the pressure, and if not actually rejecting the heat, at least communicating it to the water by other means.

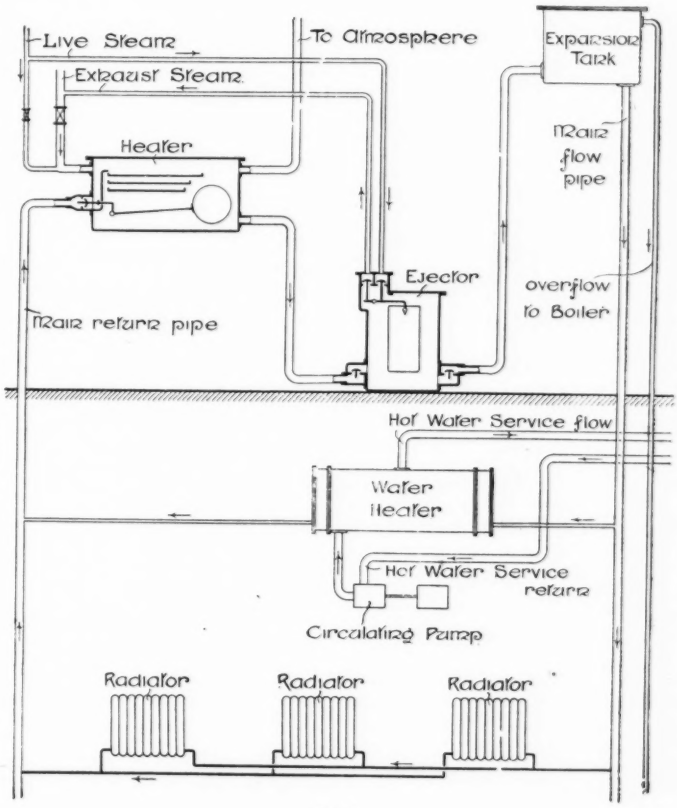


Fig. 1.

It will thus again be seen that the reason for the existence of all these redundant parts is the necessity of equating the pressures as between the various parts of the system.

Now the object of this system is to dispense with all these redundant parts (viz., the calorifier tube with all that it entails in the way of traps and valves, the redundant parts of the pump, with all they entail in the way of lubrication, packing and dirty condensation) by tackling the pressure problem. Once that problem is solved, as in this system, the raison d'être of all the redundant parts disappears. As is almost invariably the case, the elimination of redundant parts is attended by an improvement in working, ease of manipulation and cheapness of construction, and the present case is no exception to that rule.

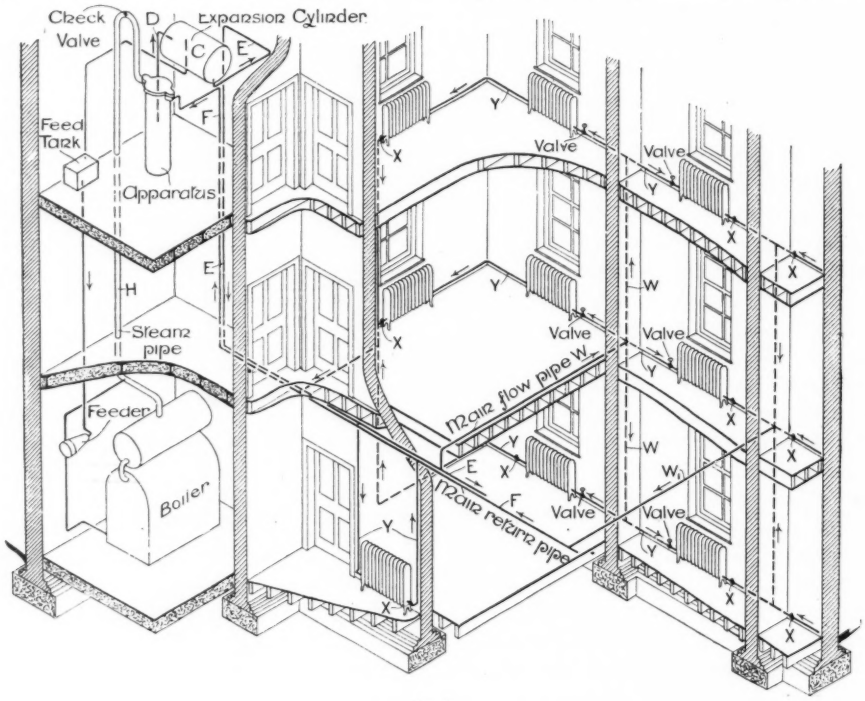


Fig. 2.

The method adopted in this system for the elimination of these redundant parts is in principle as follows:

(1) To release the pressure of water in the return pipe from the static head due to the height of the expansion tank by means of a buoy valve. This produces a powerful circulation in the system of pipes. The water from the buoy valve is delivered on the uppermost of a vertical series of perforated horizontal trays fixed one above the other within the heater, and falls from one tray to the other in a shower of drops.

(2) To release the pressure of the steam from the boiler pressure through a simple form of load valve into the upper part of the same chamber. The steam thus silently heats the water by direct contact, and the heated water falls into the bottom of the heater.

(3) After being heated the water is allowed to flow into a second vessel, which is practically a float pump, through a check valve. When this vessel is full, steam pressure direct from the boiler is automatically admitted above the surface of the water, and puts the water again under the static head due to the height of the expansion tank by forcing it again into the main without agitation and therefore silently, as fast as it is received from the heater.

In order to avoid the possibility of a rapid change of temperature in the mains or radiators owing to the sudden turning on or cutting off of the steam supply, it is found to be advisable to deliver the water from the ejector direct to the expansion tank, the water in which acts as a sort of temperature buffer between the heat of the steam and the pipes.

The common pressure to which both the water and the steam are reduced depends on the character of the apparatus and the source of the steam to be used.

If, as often happens in large installations, some or all of the heat is derived from exhaust steam from electric-light engines working non-condens-

ing, it is necessary that the reduced pressure should be that of the atmosphere; in other words, that the apparatus should be connected to the atmosphere by an open pipe.

In this case, if there is not enough exhaust steam available to heat the water to the required degree, live steam is turned into the same heater by a thermostatically controlled valve.

If the engines are working condensing the pressure in the heater is the same as the absolute value of the back pressure in the engine (neglecting friction in ports and exhaust pipe). In this case the temperature to which the water is heated can never be greater than the temperature corresponding to that back pressure. With a high vacuum this temperature is insufficient for practical purposes, but with a vacuum of 20 inches of mercury good results can be obtained

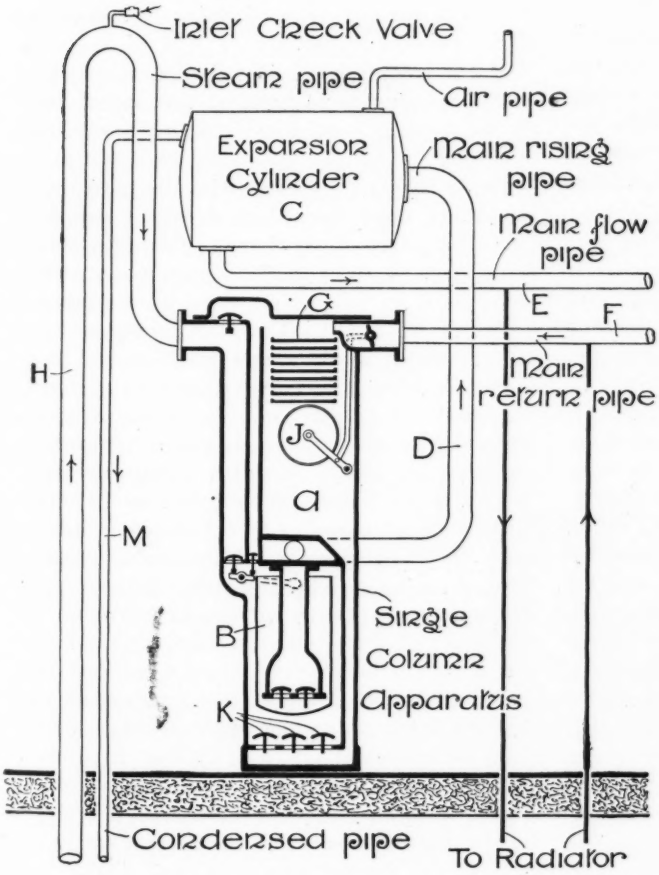


Fig. 3.

at 160 degrees. Live steam can be turned into this vacuum just as in the case of atmospheric pressure. In installations operated by low-pressure steam boilers the pressure maintained in the heater is the pressure corresponding to the absolute temperature to which it is desired to raise the water. The pressure is maintained by a simple combination of valves which regulates it automatically in a simple manner.

The smaller type of apparatus up to about 10,000 square feet capacity has both parts of the apparatus cast in one piece, rendering it very inexpensive and compact. In this case the apparatus is installed in the upper part of the circulating system, the expansion tank being in such position as to maintain a head at the level of the ejector not exceeding the working pressure in the boiler. In this case the very low pressure maintained in the heater produces a powerful suction on the return pipe which, added to the difference of level of the expansion tank and the heater, produces a powerful circulating force, even at a very low boiler pressure.

In some cases where the pressure driving the ejector is liable to wide fluctuations—as, for instance, when the boiler is left for long periods without attention—it has been found advisable to use a piston pump instead of an ejector. The steam piston has a large area, so that the pump can be operated against a fairly high head, at pressures much lower than a float pump which works by direct pressure on the surface of the water. Also the employment of a piston pump is found to be advantageous in cases where the amount of exhaust steam available is ample for all requirements. It is, of course, obvious that the piston pump consumes less live steam than the float pump, in which the steam comes into direct contact with the water. This increased consumption of the float pump is of no moment where the live steam has to be employed in heating the water in the heater if not in the pump, but it would be wasteful if there is already an excess of exhaust. The chief disadvantages of a pump of the piston type are (1) that it entails a continual loss of water by condensation which cannot be returned to the boiler on account of its dirty character. (2) It needs continual attention in the way of cleaning, packing and

lubrication. (3) It is also much more expensive than a pump of the floattype.

Fig. 1 is a diagram showing the method of connections of the pipes arranged for applying in practice the principles enunciated above. Several very large installations are at work in England with the connections arranged exactly as shown here.

Each radiator or series of radiators in the whole installation is connected on the inlet side to the main flow pipe or to a branch from same. The outlet side of the radiator or series of radiators is similarly connected to the return main, so that the full effect of the circulating power is obtained through each radiator. If the dimensions of the pipes are properly determined, it is therefore impossible for the circulation to fail through any radiator.

The heated water thus put into circulation is used for a great variety of purposes, such as heating, drying, cooking and the heating of other water for hot-water supply to lavatories, sinks and baths. In the latter case the service water is heated by a tube heater receiving its heat from the circulated water.

The originally heated water or primary circulation is not drawn off for any purpose, as this water becomes in a short time practically pure distilled water. It receives a continual accession of pure distilled water from the condensed steam, and parts at the same rate with some of its own bulk, which is redistilled by the boiler and returned to the circulating system as steam, to be there recondensed. In the limit it will be seen that these conditions lead to the ultimate distillation of the whole body of the circulating water, the overflow from which will be pure distilled water for boiler feeding.

In most cases the whole of the secondary supply of water for service requirements is heated by a tube heater fixed in the heater chamber, whence it is distributed by pump circulation to the various points where it is required, so that there is no apparatus whatever outside the heater chamber. In some cases, however, separate tube heaters are fixed near the points where the supply of hot water is required, so that only one set of mains are required. This is economical, both in first cost and in heat loss, but it is found in some cases less convenient, because it prevents the temperature of the whole of the heating circuit being regulated to suit varying weather conditions without at the same time reducing the temperature of the hot-water supply.

Fig. 2 shows a diagram of the connections where a low-pressure steam boiler supplies all the heat both for heating and circulating. In this case the access of water condensed from the steam in the heater results in a continual accretion of water in the circulating system. An overflow pipe is fixed in the expansion tank and is led direct to the boiler as feed, or in some cases where a very constant water level is desired in the boiler, or where the water capacity of the boiler is limited, to a separate feed tank, whence it is again fed into the boiler through a boiler feeder. Several very large installations on this principle are now at work in England for heating and hot-water supply.

Figs. 3 and 4 show diagrammatic sections of the self-contained type of apparatus, many of which are now in use.

There is one large installation in England which contains some unusual features dictated by the peculiar conditions to which I will refer in closing.

The conditions laid down by the client were that there must be no apparatus of any kind within 200 feet of the house. That the boiler pressure must not exceed 15 pounds per square inch. That no steam pipe was to be carried into or under the house. That the apparatus must be such that it would at any time require a minimum of attention, and that it would run during the whole of Sunday and the whole of every night absolutely without attention and without the presence of an attendant being necessary. That it should automatically condense the whole of the exhaust steam given off at any time by a pair of 60-horsepower electric-light engines. That the whole of the apparatus was to be in duplicate, so that either apparatus would do the whole of the work, and that any portion of the apparatus being out of gear would not produce a stoppage. Yet a further requirement was that the hot-water service apparatus must be entirely independent of the heating apparatus; that the conservatory and certain other rooms should be arranged to be heated at will either by the heating system or the system supplying heat to the service apparatus, and finally that the shutting off of the heating apparatus in summer should absolutely shut off the heat from every pipe passing into the house except the pipes for the secondary hot-water supply system.

The boiler chamber was so low that it was impossible to command the upper part of the house by a tank placed at the top of the boiler chamber. It was, therefore, necessary to provide two entirely separate systems, one with a relatively high pressure or head, in order to command the radiators on the third floor of the house for heating purposes, and the other with a relatively low head owing to the impossibility of placing the tank at a sufficiently high level, there being no building except the house itself sufficiently high, and the presence of a hot tank in the house in the summer months being forbidden.

The boiler pressure had to be not more than 15 pounds per square inch, which made it impossible to reach the top of the house by direct pressure, so that a pair of reciprocating pumps had to be supplied with large steam pistons to overcome this pressure. The boilers had to be sectional cast iron arranged for automatic self-regulation, and the pressure in them was too high to allow them to be fed by gravity direct from the low-level primary expansion tank for the supply of heat to the service system. Further, the necessity of running the two systems simultaneously and of feeding the boilers automatically from either or both systems, and the certainty that the accretion of water from the condensed steam from the electric engines would intermittently overflow from both systems (all of which surplus water could not be allowed to get into the boilers, as it would, of course, have completely flooded them), made up together one of the most difficult problems that I have ever had to deal with.

I solved it, however, quite satisfactorily by means of this apparatus, and the installation has been at work under the above conditions for some months.

The method of solution was as follows: Two identical systems are arranged exactly as shown in Fig. 1, except that on account of the high level of the heating system tank it was necessary to employ two similar duplex pumps, one for each service, instead of the float pumps indicated in Fig. 1.

On account of the necessity for the automatic regulation of the boilers steam is provided by three large sectional cast-iron boilers, having large fuel capacity and working at from 7 to 12 pounds per square inch.

The main exhaust pipe from the electric engines after passing through an oil separator is connected direct to the heaters with free outlet on the other side to the atmosphere. When the engines are stopped or when the steam from them is insufficient, steam from the low-pressure boilers is admitted through a load valve.

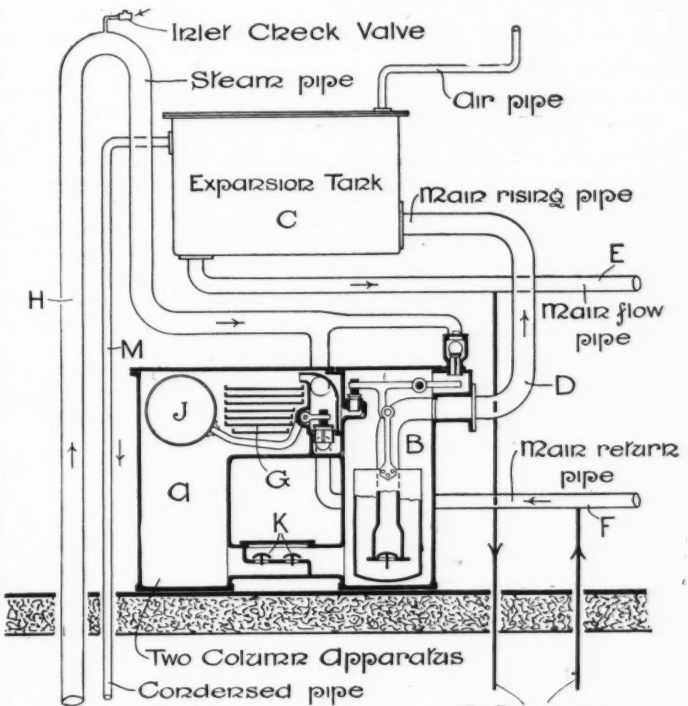


Fig. 4.

The heating or high-level expansion tank is fixed at the top of the house, and the heating pump, operated by steam from the sectional boilers, delivers the heated water into this tank, whence it is distributed to the radiators, returning to the pump chamber to be reheated.

The low-level expansion tank is fixed at the top of the boiler house, and the circulation from this tank operates a pair of tube heaters under the house 200 feet away. From these heaters a natural secondary circulation is secured to the

draw-off taps. The conservatory, the billiard room, and some other radiators are connected by special duplex valves to either system, so that it is impossible to open one without at the same time closing the other. This avoids any possibility of emptying the high-level system into the low-level system by any carelessness in leaving both valves open.

The satisfactory feeding of the boilers was the greatest difficulty. It was not possible to feed from the high-level system only, as this would have allowed all the steam condensed in the low-level system to escape, and would have called for a continual supply of hard water to the boilers to make up for this loss. On the other hand, the height of the low-level expansion tank was not sufficient to enable this water to be fed into the boilers by gravity.

This difficulty was got over as follows: The overflow from the high-level expansion tank is led into the low-level expansion tank, which receives the whole of the surplus water condensed from the electric exhaust, as well as the water condensed from the steam supplied by the low-pressure boilers to the apparatus.

The expansion tank of the low-level system is connected to a return trap, and the water from the return trap is fed into the boilers through a pair of automatic boiler feeders, which only allow the trap to feed into the boilers as much water as is required to maintain the water level. The overflow from the low-level expansion tank is led into the main feed tank, from which the feed supply to the main high-pressure electric-light boilers is fed.

The low-level expansion tank is thus kept always full, and any condensed make-up required to replace the little water lost in the condensation in the pumps (which cannot be returned to the boilers on account of its greasy character) is thus supplied, and there is no danger of flooding the boilers.

The boilers have sufficient fuel capacity for a 12 to 15-hour run at low power, and the only regulation required in the apparatus is the adjustment of a jockey weight on the lever of the automatic regulator controlling the draft in the boilers, which without any other adjustment whatever controls the whole apparatus from the lowest to the highest powers.

There are many other installations in England in which the only attention required to the system is stoking three times in 24 hours, the apparatus working day and night and producing automatically all the results obtainable from a pump system.

This is sufficient to show that the elimination of redundant parts is in this case, as usual, attended with an improved simplicity of working.

American Society of Heating and Ventilating Engineers

Summer Meeting, held at the Auditorium Hotel, Chicago, July 19-20, 1906.

The semi-annual meeting of the American Society of Heating and Ventilating Engineers was called to order at 10:20 on Thursday morning at the Auditorium hotel, Chicago. President John Gormly, of Philadelphia, occupied the chair.

Secretary William M. Mackay, of New York, read the roll call and a quorum was found present. He then read the following list of members elected since the last meetings:

Eugene P. Bradley, 1623 Chemical building, St. Louis, Mo.

Joseph H. Brady, 1526 Campbell street, Kansas City, Mo.

James H. Brown, 372 North street, Rochester, N. Y.

Charles E. Hasey, 231 Fifth avenue South, Minneapolis, Minn.

Elbert O. Haskins, 201 Irving place, Rutherford, N. J.

George D. Hoffman, 104 West Forty-second street, New York.

Frank E. Kerr, 157 West One Hundred and Eleventh place, Chicago, Ill.

Allan G. McAvity, 534 Lansdowne avenue, Montreal, Can.

D. F. Morgan, 676 Granville avenue, Chicago, Ill.

John Trainor, 877 North Howard street, Baltimore, Md.

Champlain L. Riley, 20 Broad street, New York.

Warren Webster, Camden, N. J.

George H. Wentz, Lincoln, Neb.

John Boylston, 40 Dearborn street, Chicago, Ill.

E. N. Green, Willow and Wood streets, Houston, Tex.

Gustav A. Dornheim, 464 West One Hundred and Forty-sixth street, New York.

Edward W. Soleau, Atlanta, Ga.

President Gormly then read a brief address reciting the achievements of the society.

Various communications were read by Secretary Mackay, including regrets for inability to attend from First Vice-President C. B. J. Snyder and R. P. Bolton, of New York, and Arthur H. Barker, of Trowbridge, England; the Western Society of Engineers tendered the use of its society rooms; Rear Admiral Melville, of Philadelphia, requested copies of certain papers; Stewart A. Jellett wrote concerning the formation of local chapters of the society.

The first paper on the program was by Walter Jones, of Stourbridge, England, a member of the society and one of England's foremost heating engineers, and was entitled "Heat Losses and Heat Transmission." It will be printed in this journal later. In the absence of Mr. Jones the paper was read by Professor J. H. Kinealy, of

St. Louis, who said in discussion that the authors quoted by Mr. Jones had endeavored to make the work of engineers simple and their statements should be read for ordinary or average conditions, and not understood to be interpreted in exact figures as given. The discussion was carried on by R. S. Thompson, of Springfield, Ohio, who spoke of three elements entering the problem—loss of heat by radiation, by abstraction from the walls, and by air leakage; James A. Donnelly, of New York; Samuel R. Lewis, of Chicago; James Mackay, of Chicago, who said he had found that to raise the temperature in a given room 10 degrees an increase of 25 per cent in radiation was barely sufficient; William M. Mackay, of New York had found it took upwards of 50 per cent increase in radiation to secure an increase of 10 degrees.

Topics for Discussion.

The following topics were then offered:

1. "The comparative efficiency between the completeness of air removal and the efficiency of steam radiators."

It was discussed by James A. Donnelly, of New York, who said:

I have suggested this as a topic for discussion instead of attempting to write a paper upon it for the all sufficient reason that it is a subject about which I know absolutely nothing. I have searched through all available sources in an endeavor to obtain information upon it from others and have not secured anything that was satisfactory.

I am of the opinion that the varying results that have been obtained by tests upon different styles of radiating surfaces and radiators composed of different materials have been caused to a greater extent than we have perhaps supposed by a variation in the completeness of air removal. This may be the correct way to test radiators in order to show the total advantage of one style over another, but it would be interesting to know how much to charge up to this factor and endeavor to correct it by better air removal.

It is probable that there is a difference in the efficiency of radiators circulated upon the one or the two-pipe system by reason of the difference in air removal and perhaps an increased efficiency in the use of the hot water type of radiator when used on steam with the steam connection at the top and the return at the bottom, same or opposite end. There may be a difference between those methods of circulation which employ an air valve upon a loop of the radiator to extract air and those which have an air valve upon the return, or those which conduct the air down the return to be afterward extracted at a common point of discharge.

The greater efficiency of wall radiation over pipe coils, if it really exists as it seems to do, might be materially changed by a study of this subject which would lead to a better means of air removal from the coils. It is very difficult to get a good air removal from a pipe coil built with headers and return bend coils have often been preferred because of this. Too high a velocity of entrance to the header causes the steam to skip the first pipe and this has sometimes led to the use of headers of larger size run than the pipe connections and to the use of some form of baffle plate inside the header. It is also difficult to properly locate the air valve. It is often placed on the top of the return header where it certainly does not take the air out of the lower pipes. When it is placed upon the return pipe better results are usually produced, though it very often floods with water in that location. Wherever it is placed it cannot act properly if the coil takes steam from the return end and on account of the fact that coils are usually built rather long they are very apt to do this.

Certainly a greater efficiency of air removal over the methods now employed or a type of surface better adapted to correct air removal would help hot blast radiation.

Air at varying temperatures and pressures has a varying capacity for the absorption of moisture, and steam likewise must have a certain capacity for the absorption of air before materially affecting the efficiency of the radiator. A certain proportion of air we know must be present before it can be detected by a cold spot on the radiator; yet its efficiency may fall materially before this can be done, but until it may be found in this way we usually consider that we have complete air removal.

A vessel consisting of a single body portion, of reasonable area in cross section, with a steam connection at the top and a discharge from the bottom for both water and air, with an admittance of steam at a comparatively low velocity, would seem the most favorable for complete air removal. One divided into two body portions with a steam and return connection at the bottom and an air removal some distance above would seem an unfavorable design.

These two constructions represent, to a large extent, the difference between ordinary loop steam radiators and hot water loop radiators used for steam.

There are two simple and quite exact methods that could be employed to vary the completeness of air removal in tests of this character. One would be to exhaust the air from any type of radiator to a selected fractional amount, by an air pump, close the exhausting connection and admit steam, thus heating the radiator with a known portion of the air it originally contained left in it. The other way would be to use a hot water type of radiator with a steam connection at the top, fill the radiator with water, close the connection, open the return and admit the steam. As the water ran out its place would be taken by the steam and there would be a perfect air removal; if a type of radiator was selected that was free from air pockets above the line of the air valve. By partially filling the radiator with water, tests could be made with varying amounts of air present.

The efficiency of a single horizontal pipe under condensing test in comparison with pipe coils has been shown to be so much superior that the question might be raised if some of this superiority might not be due to better air removal, and if so whether the efficiency of the coil might not be considerably improved by a study of this subject.

Professor Kinealy gave results of radiator tests with vacuums of 20, 15, 10 and 5 inches, and he invariably found the higher the initial vacuum the higher the efficiency of the radiator. C. R. Bishop, of Lockport, N. Y., spoke of the use of graduating valve to admit steam to radiators; John F. Hale, of Chicago, spoke of increased efficiency under varying degrees of air removal, saying his tests agreed with those of Professor Kinealy. He did not believe hot water radiators suited for use with steam; J. J. Blackmore, of New York, who thought air removal was not the only economic factor in the problem; distribution of the steam in the radiator was another factor. William M. Mackay had found that the size of the air valve and number of them had much to do with proper air removal.

The next topic was: 2. "The proper air space between the surfaces exposed in the heaters of blower systems."

Professor Kinealy said if a coil is built with two and one-eighth inches between centers and air is passed through at 1,000 feet a minute the result will be the same as pipes three inches between centers with twice the number of rows of pipe. He advocated putting the pipes close together, believing within reasonable limits the efficiency seeured is greater.

The next topic was: 3. "In blower systems of heating and ventilation what are the maximum allowable velocities in the different parts of the system, and what limits the velocity and why is it limited?" It was not discussed.

The next topic was "Summer tests of heating plants." Frank K. Chew, of New York; R. S. Thompson, of Springfield, Ohio, and Edward A. May, of Chicago, discussed the topic, but little was developed from it.

Afternoon Session.

James A. Donnelly, of New York, chairman, made a

Preliminary Report of a Special Committee on Standard Sizes of Steam and Return Mains.

Our preliminary report at this time is not intended to be at all complete or thorough as to the data that we have thus far collected, but more in the nature of general remarks on the subject, tending to show that the American practice is surprisingly uniform and that it is very probable that in the near future a standard may be prepared which will represent an average, differing to such a comparatively slight extent from the figures of each individual contributor that it will receive universal and spontaneous indorsement.

The collection of the data for such a standard as this is clearly within the scope of the old saw that "There is safety in numbers"; there is also correctness in an average derived from a large number of answers, and we therefore most earnestly appeal to all those who are interested in this subject, whether they are members of our society or not, to give us the benefit of their knowledge.

The committee prepared a set of questions and sent out 500 copies, including one to each member in this country. About fifteen answers were received, all but two of which came from our own members.

The first question as to size of radiator connections served to bring out an almost unanimous expression of opinion as to agreement with the manufacturers' standard. Most of those who went into details stated that they used nothing smaller than 1¼-inch on one pipe work and several decreased the amounts 20 or 25 per cent.

The compiled results from the answers in regard to maximum amounts of radiation permissible upon low pressure steam mains in plants of moderate size or those not having over 100 feet run of main is given in the following table and in the diagrams:

	Highest.	Lowest.	Average.
1 inch	100	40	59
1¼ inch	125	75	94
1½ inch	250	126	171
2 inch	400	286	335
2½ inch	700	500	594
3 inch	1,280	800	994
3½ inch	1,600	1,100	1,407
4 inch	2,560	1,500	1,971
5 inch	3,900	3,500	3,655
6 inch	6,400	5,000	5,700
8 inch	13,500	8,000	11,850
10 inch	23,800	15,000	20,950
12 inch	40,000	30,000	35,777
14 inch	55,600	40,000	53,137
16 inch	81,000	75,000	87,437

In the large sizes the answers run remarkably close together; the average difference in the sizes from 5 to 16-inch between the average and the highest answer received being only 7.4 per cent; in the sizes from 2½ to 16-inch it is 11 per cent, and in all sizes from 1 to 16-inch, 15.7 per cent.

The greater disagreement in the smaller sizes arises from the fact that some of those answering state that it is their practice to put almost double the amount of radiation on a pipe as a steam main than as a radiator connection; while others put less on it as a main.

Many of the answers received do not take up the question of return main sizes at all, and those that do differ to a considerable extent.

Almost all agree that the adoption of a standard would be desirable and beneficial to the profession.

A diagram showed the answers as they approached the average.

J. J. Blackmore, chairman, made a preliminary report of a special committee on data for steam heating, reading a circular letter which it is proposed to send to each member asking for specific information as to practice in different parts of the country. The report is as follows:

At the last annual meeting of the American Society of Heating & Ventilating Engineers, held at New York in January, the question of collecting data on steam heating of small buildings was discussed.

It was generally felt that the records of the society did not contain in a concise form the opinions of enough members to put on our records the general practice in vogue for this class of buildings.

A committee of three was appointed—J. J. Blackmore, B. H. Carpenter and A. M. Feldman—to collect data for the use of the committee on standards, who will tabulate the data gathered for publication in the transactions of the society.

The committee begs that you will carefully read over the inclosed circular, and as far as possible, answer all the questions raised, and any more that occurs to you, that will throw light on the practice in use in your locality for such buildings. A complete specification for such a building from you, stating how you arrived at the different size radiators and the size boiler, would materially assist.

The questions asked are not complete, but are intended to bring out as far as possible all the salient points in connection with such a heating apparatus. For the purpose of figuring we will assume the first floor has a 10-foot ceiling, the second 9-foot and the attic 8-foot.

Trusting you will give this matter your earnest consideration and give us all the data you have on the subject of steam heating for small buildings

QUESTIONS BY COMMITTEE ON STEAM DATA.

1. What method do you use for determining the amount of direct steam radiation needed for small buildings, such as small and medium sized residences and stores?

2. If you use a rule that provides for wall exposure and glass exposure, please state what such rule is and how you came to adopt it?

3. If you figure from the cubical contents only, how do you provide for the different exposures and how have you found the rule work out?

4. In your calculations do you figure for any definite pressure of steam in the radiators when figuring a given quantity of radiation to heat a house in zero weather?

5. Have you had experience in (so-called) direct indirect heating for such buildings? If so, how much extra radiation do you figure? Do you figure on any definite quantity of air being introduced into rooms in such a system?

6. What is your method of figuring for indirect radiation? Number of changes of air per hour? Method of extracting foul air from the room? Method of boxing indirect?

7. Size of cold air inlet compared with warm air outlet?

8. Quantity of cold and warm air per foot of indirect radiation?

9. Space for cold air below stack and for warm air above the stacks?

10. What rule do you adopt for sizing up the boiler for a job?

11. For direct radiation?

12. For direct indirect radiation?

13. For indirect radiation?

14. Have you any rule for grate area in small and medium sized steam boilers?

The Chicago Delegation of Master Plumbers at the National Convention in Atlantic City, N. J.

Top Row, from left to right: O. P. Bird, W. J. Schlegel, of Belleville; Chas. P. Hulbert, T. E. Walters, Aurora; C. T. Byrne, C. J. Boyd, Wm. Redieske, Wm. J. Lang, Henry Breyer, Andrew Morrison, E. J. Ryan, Danville; E. B. Hazen, Peoria.

Bottom Row, from left to right: M. J. Corboy, P. Nacey, W. F. Bahn, Geo. Franklin, A. W. Bahn, C. J. Stein, J. G. Weber, A. C. Hickey and W. C. Haviland, Aurora.

[All of Chicago unless otherwise given.]

15. Do you compare the grate surface and heating surface of a boiler with its rating before purchasing?

16. What factor of safety do you figure on for the difference in the construction of buildings?

17. Do you have a different standard or rule for brick and frame buildings?

18. Do you consider the construction of a building apart from glass exposure and wall exposure? That is, if it is a well constructed building, or otherwise?

J. J. Blackmore,
B. H. Carpenter,
R. M. Feldman,
Committee.

James Mackay, chairman, made a preliminary report of a special committee to secure specific data on hot water heating. The report is as follows:

The committee has sent out a large number of inquiries and has received very interesting replies. More inquiries will be sent out from time to time. The subject naturally divides itself into three heads, namely: Boilers, Radiation, Piping.

BOILERS.

We have had poor success in getting data from the boiler manufacturers, because many of them naturally, perhaps, believe that in answering our questions they will be divulging private and valuable information, which, if made public, might injure them. The difference in quality and kinds of fuel in different parts of the county render the situation still more difficult. We have tabulated the grate surfaces and the rated capacities of a large number of boilers of different types. We feel that data giving the average practice in proportioning grate surface to radiation capacity for the different fuels will be of value.

The committee would like all our members and any interested parties to send us answers to the following questions:

1. What size sectional or C. I. boiler would you use for a hot water heating apparatus, containing 2,000 square feet net radiation, in addition to mains; the radiation to be maintained at a temperature of 150 degrees Fahr.?

2. What method do you use in determining the size of boiler required for a given hot water heating apparatus, involving:

(a) Direct radiation,

(b) Direct indirect radiation,

(c) Indirect radiation?

3. In proportioning sectional or C. I. boilers for any given work, do you accept catalog statements, or have you a method for checking grate areas, heating surfaces, flue surfaces and areas, smoke connections, etc.? If so, please give it.

We would appreciate suggestions for further progress along these lines, or other lines, from the society.

RADIATION.

We have taken a given room under given conditions and sent out inquiries to engineers in this and in foreign countries. Great interest was manifested by nearly all to whom inquiries were sent. The answers are tabulated, and the most interesting methods used in arriving at them will be given.

We have worked back from the most conservative and apparently correct answers and checked up tables of heat transmission, loss, etc., etc., and expect to give an illustra-

tion of the means of getting the average result. This method, proven approximately correct for the given case, will by means of the tables, give a method of computing the amount of required radiation for unusual conditions.

The committee would like answers to the following questions:

1. A room in a residence is to be heated by hot water, gravity circulation. Temperature of water, 160 degrees. Room is 10 feet by 10 feet by 10 feet, two sides exposed. Outside walls, brick, 9 inches thick, furred inside. Glass in three windows, aggregate glass surface, 62 square feet. Outside temperature, zero. Maximum permissible drop in temperature of water, 20 degrees. Please state amount of direct radiation required if room is to be heated by direct only, and give method used.

2. Please state amount of indirect radiation required if room is to be heated by indirect only; indirect to be suspended from basement ceiling with outside air supply, and give method used.

We would be glad of suggestions for further data on this subject than that above outlined.

PIPING.

We have made a large number of inquiries of engineers and contractors in regular practice in installing hot water plants. These inquiries cover the sizes of mains and connections, the best of the various systems for given conditions, etc.

A list of questions covering the matter of mains is given here. The committee would appreciate answers to all or any of them.

What is your usual practice in laying out work as follows:

Usual size of main supply pipe at boiler supplying 1,800 square feet, direct radiation, three-story building?

(a) With two-pipe circulation, 120-foot circuit,

(b) With one-pipe circulation, 100-foot circuit,

(c) With overhead circulation, closed system, 120-foot circuit,

(d) With overhead circulation, open system.

Usual size of pipe supplying 1,200 square feet of indirect radiation; bottom of radiator 12 inches above top of boiler—

(a) With connection direct from boiler to radiator?

(b) With overhead circulation, supply pipe running to header?

Is it your usual custom to run supply to indirects direct from boiler, or make connection with basement main, feeding direct radiators above?

Have you noticed any different results in above connections?

Usual size of risers feeding direct radiation 80 square feet first floor; 90 square feet second floor; 60 square feet third floor; 10 foot ceilings—

(a) With up-faced circulation having separate return pipe?

(b) With overhead circulation, one pipe?

Usual size of riser, supplying 90 square feet direct radiation, second floor; 10-foot ceilings—

(a) With up-feed circulation having separate return pipe?

(b) With overhead circulation, one pipe?

Usual size of direct radiator connections, first floor—

(a) 30 square feet and under?

(b) Not exceeding 60 square feet?

Usual size direct radiator connections, first floor—

(a) Not exceeding 100 square feet?

(b) 100 square feet and over?

Usual size direct radiator connections, second floor—

(a) 30 square feet and under?

(b) Not exceeding 60 square feet?

(c) Not exceeding 100 square feet?

(d) 100 square feet and over?

Usual size direct radiator connections, third floor—

(a) 30 square feet and under?

(b) Not exceeding 60 square feet?

(c) Not exceeding 100 square feet?

(d) 100 square feet and over?

IN GENERAL.

We have worked five months on this very interesting subject, and while we expect to have a report at the annual meeting, we wish to be sure we are working on the lines intended by the society at the time of our appointment.

We desire your suggestions and criticism on the above outlined program and further desire any information which any member may have to suggest along the lines of our researches. Respectfully submitted,

Jas. Mackay,
Ed. F. Capron,
S. R. Lewis.

The reports were received, ordered printed and submitted to the members.

Local Chapters.

The application of Chicago members to be permitted to form a local chapter created considerable discussion, and it was decided to instruct the matter to the Board of Governors before the members in the proper way for acceptance or rejection.

The paper of the afternoon was by A. H. Barker, of Trowbridge, England, on "The Elimination of Redundant Parts in the Forced Circulation of Hot Water." It is printed in this issue of "Domestic Engineering."

After the reading of the paper the following topics were presented for discussion:

5. Natural versus mechanical and upward versus downward ventilation for rooms in school and larger auditoriums.

6. The advantages attending the use of steam and hot water in heating a number of buildings requiring 150 to 200 horsepower, from a central plant.

7. The best method of calculating the sizes of the mains in a hot water heating plant.

8. The effect of the size of the mains on the height of the water line in different parts of a gravity steam heating system.

9. The relative economy in fuel of steam, vapor, vacuum and hot water heating for residences.

SECOND DAY.

At the morning session on Friday papers were read by William G. Snow on "Notes on the Use of Feed Water Heaters in Connection with Heating Systems," and by R. S. Thompson on "Fads and Fallacies in Hot Air Heating."

Discussion was had on these topics:

10. The relation of heat units per cubic foot and the cost of gas to its economical and possible use in heating water.

11. In a hot air furnace burning 5 pounds of anthracite coal per square foot of grate per hour, what proportion of heating surface should be provided in relation to the grate surface to insure economy and efficiency.

12. When the cubic contents and temperature of the air supply are known, what velocity should be considered when determining the size of the horizontal and vertical pipes and register outlets in a warm air heating system with outside air supply and when the air is circulated, also the size of these air supply ducts and the velocity in them.

AFTERNOON SESSION.

Papers were read by James A. Donnelly on "Wall Radiators versus Long Pipe Coils," and by A. C. Jones on "An Improved Application of Hot Air Heating."

These topics were presented for discussion:

13. The desirability of accumulating data as to the life of wrought iron and steel pipes in steam and hot water heating systems.

14. Chimneys versus forced draft and their relative advantages.

15. The durability of different kinds of nipples for connecting radiator sections relative to the material and the capacity to withstand shocks and strains, also the effect on boiler connections.

Up to the hour of going to press the following is a

List of Those Registered:

John Gormly, Philadelphia.
T. J. Waters, Chicago.
W. M. Mackay, New York.
James Mackay, Chicago.
Frank K. Chew, New York.
W. C. Green, Cincinnati.
Mrs. W. C. Green, Cincinnati.
W. G. Franz, Cincinnati.
W. H. Driscoll, Jersey City.
John F. Hale, Chicago.

Officers of the United Association of Journeymen Plumbers, Gas Fitters, Steam Fitters and Steam Fitters' Helpers at the recent convention in the Associations' Headquarters, Chicago.

Reading from left to right, upper row, as follows: Tenth Vice-President E. W. Shirk, Sixth Vice-President John R. Alpine, Eighth Vice-President Wm. Yundt, Ninth Vice-President E. C. Hicks, Third Vice-President J. J. McTighe, Organizer Dooley, Fourth Vice-President Wm. H. Proctor.

Bottom row, from left to right: Fifth Vice-President John M. Love, President Wm. M. Merrick, Organizer Thos. E. Burke, Secretary-Treasurer L. W. Tilden, Second Vice-President George Olson.

(Reproduced by courtesy of the "Official Journal.")

Entertainment.

The ladies of Chicago met the visiting ladies at the Auditorium Thursday morning and took them out for automobile rides in the afternoon and on Friday. On Friday evening the Chicago members tendered the visiting members and guests a banquet at the Auditorium Hotel. As we go to press before this banquet is over an account of it is necessarily deferred until next week.

J. M. Stannard, Chicago.
J. H. Kinealy, St. Louis.
A. T. Hoyt, Warren, Ohio.
Joseph Graham, New York.
John O. Galloup, Battle Creek, Mich.
John A. Connelly, New York.
A. A. Edgar, Philadelphia.
Fred W. Smith, Dunkirk, N. Y.
Henry S. Martin, Dunkirk, N. Y.
F. K. Houston, Rockford, Ill.

Aug. T. Kehm, Chicago.
E. F. Capron, Chicago.
Chas. B. Ball, Chicago.
James A. Donnelly, New York.
C. D. McArthur, New York.
W. M. Patterson, Appleton, Wis.
D. I. Cooke, Chicago.
R. A. Widdicomb, Chicago.
R. S. Thompson, Springfield, Ohio.
Edwin A. May, Chicago.
L. J. Wing, New York.
F. E. Kerr, Chicago.
N. L. Patterson, Chicago.
Chas. K. Foster, Chicago.
John P. Schaffer, Pittsburg.
Bert E. Davis, Kansas City.
Eugene Bradley, St. Louis.
Wm. C. Busche, St. Louis.
Everett N. Murphy, Chicago.
Frank G. McCann, New York.
S. R. Lewis, Chicago.
J. H. Haraling, La Porte, Ind.
M. P. Osborne, Philadelphia.
Wm. G. Snow, Boston.
Herbert I. Lord, Chicago.
John Boyleston, Chicago.
George E. Downe, Chicago.
Jno. K. Allen, Chicago.
H. A. Mallery, New York.
Sam G. Neiler, Chicago.
Wm. H. Hill, Chicago.
F. W. Lamb, Chicago.
Charles R. Bishop, Lockport, N. Y.
W. W. Curtis, Chicago.
Geo. D. Hoffman, Chicago.
Arthur L. Rice, Chicago.
W. B. Graves, Chicago.
W. L. Fergus, Chicago.
F. N. Jewett.
L. W. Straw, Danville, Ill.
E. J. Ryan, Danville, Ill.
J. J. Blackmore, New York.
A. A. Ainsworth, Chicago.
Geo. H. Kirk, Chicago.
W. H. Davidson, Chicago.
John S. Brennan, Milwaukee.
Alf. Tersland, Chicago.
E. H. Younglove, Chicago.
Benj. Kauffman, Chicago.
Chas. F. Newport, Chicago.
Wm. M. Scudder, Chicago.
H. B. McLelland, Chicago.
Theo. Vladimroff, Chicago.
Melvel B. McIntyre, Chicago.
W. L. Bronaugh, Chicago.
F. F. MacNichol, Oshkosh, Wis.
D. F. Morgan, Chicago.
J. H. Martin, Jr., Chicago.
E. M. Gordon, Chicago.
R. A. Apperson, Kansas City, Mo.
H. W. Ellis, Chicago.
Andrew Harvey, Detroit.
Theo. Weinshank, Indianapolis.
S. S. Harnell, Chicago.
E. H. Murphy, Chicago.
Geo. C. Andrews, Minneapolis.
H. V. Stoddard, Minneapolis.
Albert Aschaffenburg, New Orleans.
John T. Shay, Chicago.
A. S. Armagnac, New York.
A. V. Conine, Chicago.
Warren Webster, Camden, N. J.
J. J. Miller, Chicago.
Robert H. Walch, M. D., Philadelphia.
Lloyd Howell, Chicago.
A. E. Schad, Chicago.
L. A. Scovil, Chicago.
Jas. H. Davis, Chicago.
C. W. Sisson, Chicago.
Morris R. Ebersole, Chicago.
Jno. A. Noone, Chicago.
Robert L. Gifford, Chicago.
C. D. Brownell, Champaign, Ill.
E. P. Stark, Chicago.
Edw. P. Mott, Chicago.
S. B. Wirtz, Chicago.
Wm. E. Taylor, Toledo.
Frank G. Rhegley, Chicago.
E. P. Allen, Chicago.
S. S. Bremer, Chicago.
Geo. H. Dickerson, Chicago.
Herman J. Warneke, Minneapolis.
Daniel Stern, Chicago.
A. H. Shroth, Chicago.
J. Z. Young, Chicago.
S. J. Madden, Mendota, Ill.
H. J. Ott, Chicago.
A. Kilander, Chicago.
E. T. Fishwick, Chicago.
R. W. Larkin, Chicago.
Henry J. Knorr, Chicago.
William Pickels, Chicago.
Ralph P. Willis, Springfield, O.

METAL MARKET

New York Metal Market, July 17.

Copper, Lake	$18.62½
Antimony (Cookson's)	25.00
Pig Lead	5.75
Spelter	6.10
Straits Tin	36.65

Chicago Iron Market, July 19.

Southern, No. 1 Foundry	$18.15@18.40
Southern, No. 2 Foundry	17.65@17.90
Lake Superior Charcoal	19.00@19.25
Lake Superior Coke Iron, No. 1 Foundry	18.50@18.75
Lake Superior Coke Iron, No. 2 Foundry	18.00@18.25

INDUSTRIAL STOCKS

The following are the prices bid and asked on the following industrial stocks, listed on the Chicago and New York Stock Exchanges, at the close of business on Thursday, July 19:

	Bid.	Asked.
American Radiator Co., com	117	119
American Radiator Co., pfd	130	135
American Steel Foundries, com	10	11
American Steel Foundries, pfd	41	42
Amalgamated Copper	96¼	96¼
Nat. E. & S. Co., com	15	17
Nat. E. & S. Co., pfd	82	87
National Lead Co., com	72	73
National Lead Co., pfd	102	103
Republic Iron & Steel, com	25	26
Republic Iron & Steel, pfd	93	94
Trenton Potteries Co., com	20	24
Trenton Potteries Co., pfd	101	104
U. S. Cast Iron Pipe Co., com	45	46
U. S. Cast Iron Pipe Co., pfd	92	93
U. S. Steel, com	34½	34⅜
U. S. Steel, pfd	102	102¼

Grand Forks, Minn.—Baker & Gudim have engaged in the plumbing business here.

Skiotook, Ind. Ter.—T. F. Douglass has opened a plumbing establishment in the Javine building on North Broadway.

The International Acetylene Association in Annual Convention

THE ninth annual meeting of the International Acetylene Association was opened at the Chalfonte, Atlantic City, N. J., on Tuesday morning, July 10, when Mayor Stoy met the delegates at an informal reception and tendered them the freedom of the city. The formal act of opening the convention was accomplished when the mayor, after the address of welcome, turned on the lights which marked the presence of the convention at the resort.

Morning and afternoon sessions were held in the large meeting hall of the hotel, and besides the executive work which was done a number of valuable papers were read by those in attendance and general discussions were indulged in concerning matters relating to the trade.

The morning and afternoon session of Tuesday and Wednesday, July 10 and 11, and the morning session of Thursday, July 12, were devoted to the reading of papers, the reports of committees, and lectures, and the afternoon of Thursday, July 12, the last day of the convention, was given over to the election of officers, the passing of resolutions of thanks, and the discussion of the next meeting place of the annual.

The committee on membership reported an increase of twenty-eight new members and the reception of two from associate to active membership. This brings the total membership up to ninety-two. During the morning session on Thursday a resolution was presented authorizing one day of the annual session of the conventions to be held hereafter to be devoted to the deliberations of the acetylene generator manufacturers. The motion was passed.

When the elections were held H. I. Gannett, J. K. Rush and A. C. Einstein were nominated for president. The ballot resulted in the election of H. I. Gannett, whose election was afterward made unanimous. A. C. Einstein was elected vice-president. Lucius S. Bigelow, who rendered conspicuously able service during the past year, was reëlected secretary and treasurer. A resolution was also passed appropriating $150 for necessary expenses attached to the office of secretary, outside of the usual disbursements.

According to the change in the constitution adopted at the last meeting, that the directors should ballot among themselves to see which two should withdraw, slips were prepared bearing the names of directors who would be declared dropped. J. K. Rush and M. J. Carney were declared withdrawn. The names of those gentlemen were again put in nomination and unanimously elected again to the directorship. As the decision regarding the next meeting place of the convention rested under the bylaws with the executive committee, an informal vote was taken on the place and time of the next gathering, which would be used by the committee as a guide in their selection of a location. Jamestown, Va., and Chattanooga, Tenn., both received an equal number of votes, while the month of July was declared the most popular time to hold the convention.

After the business of electing officers was finished votes of thanks were extended to the entertainment committees and the management of the various enterprises at Atlantic City which had done so much to make the meeting a success.

Besides the special papers that were read there were letters from absent members of the association, among them one from Henry E. Shaffer, one of the pioneers in the acetylene business, and one from Augustine Davis on "Acetylene in England."

There was no formal dinner at the convention, but one portion of the dining room at the hotel was reserved for the delegates, and there, with each meal constituting an informal gathering, the social features of the meeting were brought to the fore more prominently than they could have been otherwise.

On Wednesday night the entire body of the delegates, accompanied by their ladies, participated in a roller chair parade on the board walk. There were about fifty chairs in the procession, and they attracted great attention. After the parade the gathering assembled in a body at the Steeplechase pier, where they attended the vaudeville show, and afterwards returned to the hotel.

During the convention the Steeplechase pier and Richards' baths were illuminated by acetylene each night, the whole supplied by a generator brought there for the occasion. The result was one of peculiar attraction, as the brilliancy of the lights completely eclipsed those of the board walk and were an effective object lesson on the worth of acetylene as an illuminant.

The following papers were read at the various sessions of the convention:

"Development in Carbide and Acetylene Industries," by W. P. Martin, vice-president Union Carbide Company.

"Acetylene in European Countries," Birger Hammer, Hamburg, Germany.

"Recent Experiments Showing Effect of Acetylene Light on Plant Growth," illustrated lecture by Professor John Craig, Cornell University.

"Some Principles in Acetylene Trade Getting," by Elias A. Long, editor of the Acetylene Journal.

"Sunlight and Acetylene," by A. C. Morrison of N. W. Ayer & Son.

"Marine and Vehicle Lighting," by O. F. Ostby, the General Acetylene Company.

"Legitimate Trade Push," by A. C. Collins, secretary-treasurer of Davis Acetylene Company.

"Promoting Business," by M. J. Carney, general manager Acetylene Apparatus Manufacturing Company.

"Development and Practicability of Portable Acetylene House Lamps," by E. W. Beck, of Iden & Co.

"Engineering of Illumination," illustrated lecture by M. Van Rensselaer Lansingh.

"Relation of the Underwriters' Laboratories to Acetylene," by George L. Wilson, of F. Cortez Wilson & Co.

"Advantages of Acetylene for Cooking and Heating" and "Incandescent Lighting with Acetylene," by J. Harris, of the Harris Calorifle Company.

Among those in attendance were the following: H. I. Gannett, Omaha, Neb.; J. R. Crawford, New York city; J. M. James, New York city; M. J. Carney, Chicago; A. C. Einstein, St. Louis; P. A. Rose, Chicago; William M. Crane, New York; Charles F. Tunn, Yonkers, N. Y.; C. A. Howe, New York; Van Rensselaer Lansingh, New York; Thomas C. Hoyt, Emmittsburg, Md.; B. O'Shea, Chicago; Clarence N. DeVoe, Auburn, N. Y.; Thomas H. Harris, Havana, Cuba; J. M. Erickson, Miami, Fla.;

Clinton B. Jarman, Greensborough, Md.; Arnold J. Wedneyer, Liberty, N. Y.; T. Cressy Morrison, Chicago; A. C. Schlieder, Buffalo; Oscar F. Ostby, New York; R. B. Steward, Chattanooga, Tenn.; Lucius S. Bigelow, New York; Charles A. Long, Chicago; Giles W. Mead, New York; J. B. Carroll, Chicago; Lewis R. Arnett, Plainfield, N. J.; J. B. Small and C. E. Small, Hammond, N. J.; William Joyce, R. W. Powell, John T. Cochran, George F. Klemm, Philadelphia, and F. J. Byrne, of "Domestic Engineering," Chicago.

WHOLESALE PLUMBING

Boggs & Clarke, Syracuse, N. Y., state that prospects in the line covered by the goods which they manufacture are about the same as they were last year. There are no signs of waning prosperity.

Charles G. Blatchley, of Philadelphia, Pa., had his pump factory at Swanson street and Snyder avenue in that city destroyed by fire on Friday, July 13. The loss is estimated at $45,000 and was covered by insurance.

Silver & Co., of Brooklyn, N. Y., write that trade prospects in their line are better now than they were last year at this time, and they see no signs of diminishing prosperity. They have recently added a new warehouse to their facilities.

The Ideal Plumbers' Specialty Company, of Brooklyn, N. Y., has been incorporated, with a capital of $7,500, to manufacture plumbers' specialties. The incorporators are Edwin Hayward and E. A. Hayward, Brooklyn; George M. Willment, New York.

The Wheeling Pottery Company, of Wheeling, W. Va., has recently added a line of solid porcelain to its products. They look upon trade prospects as being just as good as they were last year and see no signs that trade is going to be any less.

The Illinois Malleable Iron Company, of Chicago, for many years at 30-32 West Monroe street, has now removed to 537-539 Diversey boulevard, where there has been erected for its general offices and warerooms a six-story and basement building 60x200 feet.

The Ohio Brass and Pump Company, of Columbus, Ohio, say that trade prospects with them are better than ever before, the sales for five months of this year being more than 50 per cent in excess of the amount during the same period last year. They expect 1906 to be the largest year's business in their history. They have recently placed orders for additional brass working machinery, which when received and put in operation will increase their output about 33⅓ per cent.

The Frankfort Brass Works, of Frankfort, Ind., writes us that trade prospects in their line are as good or even better than they were last year at this time, and there are no signs that the prosperity of the past two or three years is waning. They have recently doubled the capacity of their factory throughout. Referring to the serious competition among jobbers which exists in spite of the large demand for goods, they say that it is as difficult to understand the reasons for this serious competition as it is to comprehend the strife which exists between manufacturers when there is a good market for their output.

WHOLESALE HEATING

The Monroe Foundry and Furnace Company, of Monroe, Mich., has recently added a new power plant to its equipment. They state that trade prospects are fully as good now as they were last year at this time. They do not expect any diminution in the demand.

The Smokeless Boiler and Furnace Company, of New York, N. Y., has been incorporated with a capital of $10,000 to manufacture heating goods. The incorporators are Robert E. Lee, 29 Broadway, New York; Louis Eilperin and Dana Wallace, 44 Court street, Brooklyn.

The Mulford Heater Company, of Galva, Ill., reports trade prospects in their line to be better than last year at this time, and they do not see any signs that the conditions of trade which have been noticed during the past two or three years are growing any less favorable. They have added the manufacture of expansion pipe hangers to their line.

STEAM and MILL SUPPLIES

The Steam Appliance Manufacturing Company, of Lockport, N. Y., has been incorporated, with a capital stock of $24,000, to manufacture water heaters and purifiers for steam boilers. The incorporators are Merton K. Doty, George Wilkinson and Charles A. Sult.

The General Fire Extinguishing Company, of Providence, R. I., called a convention at Warren, Ohio, on Tuesday and Wednesday, July 10 and 11, of its engineers and superintendents, for the purpose of discussing the best way of constructing and executing the mechanical work of the company. The convention was attended by representatives of all the branches of the company.

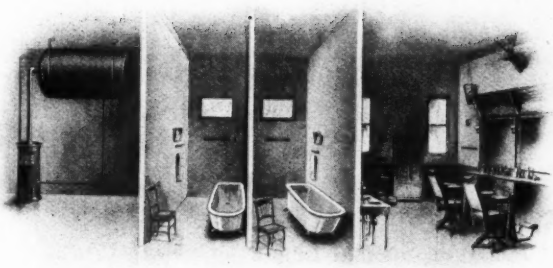
That the National Supply and Machinery Dealers' Association will hold a rousing meeting in September seems to be the unanimous opinion of all who are on the inside. There are momentous problems continually arising that will keep the convention on tiptoe for a few days, and the present indications are that there will be a large attendance. The date and city in which the convention will meet will be announced later. Detroit and Niagara Falls seem to be the most talked of of the lake cities.

The D. T. Williams Valve Company, Cincinnati, Ohio, expects to have its new plant in operation early this fall. This building, located on Hunt street, Cincinnati, will be an imposing four-story building of concrete construction throughout and will have 110,000 square feet of floor space. The front will be veneered brick, and all the latest improvements in engines, boilers, electrical fixtures, motors, etc., will be employed as an aid to their rapidly growing business. The Pennsylvania railroad will run a sidetrack to the rear of the building to facilitate shipments.

"Several hundred dealers throughout the country are now making a specialty of supplying the needs of the mill, mine, factory, shop and railway. Their stocks include thousands of articles in the 'hardware' trade. These dealers are not eligible, neither do they properly belong in the National Hardware Association nor in the Southern Wholesale Jobbers' Association. This evolution in the

All Kinds of Water.

One is surprised to learn how many different uses the IDEAL Tank Water Heaters serve, beside tank water service. One of our recent booklets itemizes 60 different known sources of demand, and there are many more.



Extensively used for Barber Shops, Bathing Establishments, Natatoriums

For hot faucet water—washings—tempering water—for prevention of freezing—for flat iron heating—drying purposes — warming small and large buildings, etc., etc.

AMERICAN RADIATORS & IDEAL BOILERS

AMERICAN RADIATOR COMPANY

General Offices: 282-284 Michigan Avenue, Chicago.

New York, 104-108 West 42nd Street.
Boston, 129-131 Federal Street.
Philadelphia, 1342 Arch Street.
Baltimore, 109 E. Lombard Street.
Buffalo, Court and Franklin Streets.
Pittsburg, 601-603 Hartje Building.
Cincinnati, 213 W. Fourth Street.
Chicago, 282-284 Michigan Avenue.
Milwaukee, 126 Sycamore Street.
Indianapolis, 511 Lemcke Building.
Detroit, 225 Jefferson Avenue.
St. Louis, 207-209 N. Tenth St.
Atlanta, 11 North Forsyth Street.
Omaha, 413-417 S. Tenth Street.
Kansas City, 313 E. Tenth Street.
Minneapolis, 229 Fifth Street, South.
Denver, 831 Fifteenth Street.
Seattle, 1215-1216 Alaska Building.
San Francisco, 1317 Gough Street.
London, E. C., 89-90 Shoe Lane.
Paris, 24 Rue de Magador.

FIFTY ONE YEARS OF QUALITY
WOLFF'S PLUMBING GOODS

ESTABLISHED 1855.

F 5954—THE "AVON"
With Enameled All Over Special Leg

F 5954 includes Wolff's Enameled Iron Lavatory, The "Avon" Ideal Bowl and Ornamental Apron CAST IN ONE PIECE, with Enameled all over special Leg and Wall Braces, Nickel Plated Ideal Basin Waste with China Top, two Nickel Plated No. 15 Fuller Faucets with China Handles and Indexes, Nickel Plated Special CAST BRASS Trap (F 6460) with Vent and Outlet to wall, and two IRON PIPE SIZE Short Supply Pipes to wall.

MADE IN TWO SIZES { Size of Lavatory, 19x27 inches; Bowl, 11 x15 inches
Size of Lavatory, 23x33 inches; Bowl, 13½x18 inches

Wall Braces are arranged to allow about 1½ inches between Wall and Roll Rim.

Price, 19x27, complete as described . . $41.50 Price, 23x33, complete as described . . $47.00

When ordering or specifying give Catalogue number and size.

Our Guarantee Label is put on all of our Lavatories

L. WOLFF MANUFACTURING COMPANY

MANUFACTURERS OF PLUMBING GOODS EXCLUSIVELY

GENERAL OFFICE 93 W. LAKE ST. SHOW ROOMS 91 DEARBORN ST. CHICAGO

TRENTON CHICAGO DENVER

trade has opened a new field for association activity not covered by the above named organizations, and it is important to those engaged in these kindred lines of business that this comparatively new competitive factor be brought into a closer and more harmonious relationship.''—**A. T. Anderson, Cleveland.**

The Republic Belting and Supply Company, Cleveland, Ohio, is the latest addition to the mill supply line. This house is the outgrowth of the Bodifield Belting Company, established about twenty years ago. The new company occupies commodious quarters on the corner of Seneca and Michigan streets, and through the increased facilities afforded by the new quarters will be enabled not only to do a large general mill supply business but especially will allow it to double the output of leather belting. The old company did a large business in leather belting in the Ohio section for years, and the new company will extend operations throughout the entire country. The officers of the company are encouraged in their new operations by the fact that for years the belting manufactured by the company has been so extensively used within a radius of 300 miles of Cleveland, which embraces the largest iron producing district in the world and consequently a district in which belting would naturally be put to the severest test. The officers of the company are E. C. McKay, president and manager; S. C. Cutler, vice-president; S. H. Moore, secretary, and F. J. Man, manager of the supply department.

Any advertiser in Domestic Engineering is at liberty to examine its paid subscription list at any time.

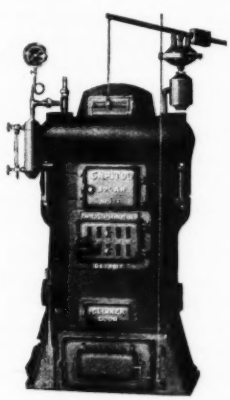
PERSONAL

Charles A. Ford, of Whitney & Ford, 4315 Cottage Grove avenue, Chicago, is at his desk again after a two weeks' outing in the East.

A. T. Hoyt, heating engineer, of Warren, Ohio, paid a short visit to Chicago and Milwaukee this week, attending a part of the sessions of the American Society of Heating and Ventilating Engineers.

Frank Nolan, plumbing inspector at Louisville, Ky., surprised his friends this week by announcing that he was married on Tuesday, July 3, to Miss Anna Dotson. Mr. and Mrs. Nolan will reside at 2243 Baxter avenue.

C. K. Sanborn, vice-president and manager of the New York office of the Haydenville Company, of Haydenville, Mass., and his wife have the sympathy of their many friends in the trade on account of the sudden and sad demise of Mrs. Sanborn's father, Robert B. Shimer, a prominent commission merchant of Brooklyn, N. Y., which occurred on Saturday morning, July 14, at Ridgewood, N. J., where Mr. Shimer accidentally stepped in front of a rapidly running passenger train, after having waited carefully to let a freight train pass, and was instantly killed. His body was hurled a distance of forty feet, and he was dead when his wife and Mr. and Mrs. Sanborn, who were with him at the time, reached his side, which they did in a few seconds. Mr. Shimer was seventy-one years of age and was a member of several prominent mercantile and fraternal societies. He is survived by his wife, a daughter (Mrs. Sanborn) and two sons.



CAPITOL BOILERS AND RADIATORS

IF YOU

are in doubt as to the line to sell—it is only a question of knowing the facts. The facts—testified to by thousands of well-pleased users in every part of the country—clinch the verdict in favor of Capitol Boilers and Radiators—the "always reliable" kind. Send for handsome new catalog.

United States Heater Company

Home Office and Works: Fort St. & Campbell Ave. DETROIT, MICHIGAN.

Branches:
New York; 129 Worth St.
Chicago; 42 Dearborn St.
Kansas City, Mo.; 114 W. 11th St.
Omaha, Neb.; 419 S. 15th St.

Sales Agencies:
J. H. CUNNINGHAM & CO., Boston, Mass.
KELLOGG & STOKES STOVE CO., Denver, Colo.
PLUMBING & S. F. SUPPLIES CO., Minneapolis, Minn.

ASSOCIATION NEWS

Paterson, N. J.—The Paterson Master Plumbers' Association will hold its fifth annual outing at Coney Island Saturday, August 4. Luncheon and dinner will be served at Stauch's hall, luncheon at 11 o'clock a. m. and dinner at 3:30 p. m.

Chicago, Ill.—The Chicago Master Plumbers' Association has dispensed with its regular meetings during the warm season, owing to the fact that so many of its members try to spend as much time as possible outside of the city. But the board of directors holds its regular meetings as usual, and at its last meeting it had the pleasure of initiating nine new members—another evidence of the energetic leadership of President W. J. Lang, who does not believe in standing still, but in growth and progress all the time, even during vacations.

Philadelphia, Pa.—At the meeting of the Master Plumbers' Association held on July 5 the following three new members were admitted: Cook Bros., Armbrust & McGurk and Howard H. Crowell. It was determined at this meeting to have the midsummer outing, and after some discussion "The Orchard" at Essington, Pa., a suburb of Philadelphia, was fixed upon. This place has a large, roomy clubhouse, with grounds sloping down to the river, and has been the objective point in the past of several of the picnics of the association. A good time has always been had there and a majority of the members were in favor of it. The date has not been set, but some day late in July or early in August will be selected. The outing will be a purely social one and the members will be accompanied by their ladies. Invitations will be sent to associations in the vicinity and those of neighboring cities, and it is expected that the reputation of Philadelphia's well known hospitality will be sufficient to secure a good crowd.

THE LABOR FIELD

Winnipeg, Man.—One hundred and forty journeymen plumbers went on strike last week, after having been refused a lengthy list of demands, among other things an eight-hour day and wage increase of 12½ cents an hour.

New York, N. Y.—The plumbing strike is still on, and it is intimated that sympathetic strikes may be ordered, in which case it is estimated that about 50,000 men would be affected and an immense amount of work tied up.

Nashville, Tenn.—The master plumbers of this city have made application in the chancery court for an injunction restraining striking journeymen and their sympathizers from interfering with nonunion workmen. The plumbers' strike has been in force about two months.

Richmond, Va.—Between forty and fifty journeymen plumbers have gone on a strike for an increase in wages from $3 for junior plumbers and $3.50 for senior plumbers to $3.50 for juniors and $4 for seniors. The journeymen have also asked for a closed shop and regulation of the apprentice system.

San Francisco, Cal.—The plumbing strike seems to be petering out, as the Master Plumbers' Association has decided to allow its members to do as they wish in the matter of wages. This is virtually a victory for the journeymen, and most of them are now getting the increase in wages which they asked for.

OBITUARY

David J. Collins, one of the pioneer master plumbers of St. Louis, Mo., and ex-president of the local Master Plumbers' Association, passed on at the St. John's hospital in that city on Monday evening, July 16, from appendicitis, after an operation had been performed in the hope of saving his life. Mr. Collins was a noble and kind-hearted gentleman with a host of friends both in and

The late David J. Collins.

outside of the trade, who will regret to learn of his demise. He was known to old convention-goers for the able and efficient service he rendered the National Association of Master Plumbers while he held the office of sergeant-at-arms. He is survived by his wife and seven children. The funeral was held on Thursday from his late residence, 5109 Maple avenue, to St. Mark's church, and the interment took place at Calvary cemetery.

William L. McAfee, a pioneer plumber of Baltimore, Md., was taken away suddenly on Saturday night, July 14, by being run over by an electric car. Mr. McAfee was in his seventy-sixth year and was still in business at his old stand, 32 East Lanvale street, at the time of his demise. He is survived by a son, William A. McAfee, chief of the Baltimore fire department and formerly state fire marshal.

Marshalltown, Iowa.—The McCarten Plumbing Company is the style of a new establishment which has just been opened at 13 West Main street. W. C. McCarten is at the head of the enterprise.

TOO LATE TO CLASSIFY

WANTED—FOUR FIRST CLASS PLUMBERS; WAGES $5 a day; 8 hours; steady work; no strike; grand climate and new work. Address Hot Springs Plumbing & Machine Co., Hot Springs, Ark. 7-21

WANTED—TRAVELING SALESMAN IN WESTERN TERritory to take wood drain board as side line; liberal commission; small model as sample. A. H. Warner & Co., 16 Federal St., Bristol, Conn. 7-28

PATENTS

824,728. **Process of Regulating Combustion.** Paul Larsen, Copenhagen, Denmark.

F. T. Bailey & Co., of North Scituate, Mass., is installing Cooper's Nautilus closets in a residence in that city.—Adv.

824,709. **Water Heater.** John Demarest, Binghamton, N. Y.

Hilborn & Faulkner, Bucyrus, Ohio, are remodeling a residence in that city, using Cooper's Nautilus closets.—Adv.

824,715. **Steam Trap.** William H. Googins, Brooklyn, N. Y.

A. E. Touchet, of Boston, is using Cooper's goods in some work he has on hand.—Adv.

824,163. **Valve Indicator.** Edwin H. Whitney, Waterford, N. Y., assignor to Eddy Valve Company, Waterford, N. Y.

Dean Bros., of Dorcester, Mass., are installing Cooper's Nautilus closets in a residence in that city.—Adv.

824,229. **Faucet Bung.** Dillon Beebe, Newark, N. J.

D. B. Spellman Co., of Seattle, Wash., is placing Cooper's Nautilus closets in a residence.—Adv.

824,287. **Flushing Cuspidor.** John W. Cooper, Boston, Mass.

The Arnolds-Evans Co., of Spokane, Wash., is using Cooper's goods on some work it has on hand.—Adv.

824,308. **Gas Burner.** Henry W. O'Dowd, New York, N. Y.

George Turner, of Asbury Park, N. J., is placing Cooper's Nautilus closets in a residence in that city.—Adv.

824,428. **Die Stock.** Thomas R. Leighton, East Cleveland, Ohio.

Bennett Hardware Co., of Portland, N. Y., is using Cooper's Nautilus closets in some work it has on hand.—Adv.

824,454. **Bathtub.** William Vanderman, Willimantic, Conn.

Samuel A. Esswein, of Columbus, Ohio, is placing Cooper's Nautilus water closets in a residence in that city.—Adv.

824,317. **Molding Machine.** Harris Tabor, Elizabeth, N. J., assignor to Tabor Manufacturing Co., Philadelphia, Pa., a corporation of New Jersey.

Pagington Bros., of Hyde Park, Mass., are remodeling a residence in that city, using Cooper's Nautilus closets.—Adv.

824,527. **Valve.** William Colina, Waterbury, Conn., assignor by mesne assignments to Welsbach Light Company, Gloucester City, N. J., a corporation of New Jersey.

824,554. **Steam Trap.** John T. Lindstrom, Allentown, Pa.

John C. Gunzer, of Chestnut Hill, Pa., is placing Cooper's goods in an operation he has on hand.—Adv.

824,544. **Pipe Hanger.** George Hossege, Newcastle, Pa.

Wm. B. Coffee Plg. Co., of Tacoma, Wash., is installing Cooper's fixtures in a residence in that city.—Adv.

824,642. **Clinker Catcher.** Harry A. Gibbs, Princeton, Ill., assignor of one-half to Charles H. Gibbs, Princeton, Ill.

Kettewell & Robinson, of Philadelphia, are remodeling the plumbing in College hall, University of Pennsylvania, using Cooper's goods.—Adv.

824,681. **Pressure Regulator.** Frank M. Ashley, Brooklyn, N. Y., assignor of one-half to Albert T. Scharps, New York, N. Y.

F. W. Ridgway Co., of Albany, N. Y., is installing Cooper's Nautilus closets in a residence in Pittsfield, Mass.—Adv.

12,499. **Bathtub Seat.** John P. Eustis, Newtonville, Mass.

T. J. Welch & Co., of Boston, are placing Cooper's Nautilus closets in a residence in that city.—Adv.

824,764. **Pipe Cutter.** William S. Wakeley, Harvard, Ill.

Joplin Sanitary Co., of Joplin, Mo., is using Cooper's goods in some work it has on hand.—Adv.

PATENTS PROCURED

In all countries by **Frank M. Ashley M. E.**

EXPERT IN PATENT CAUSES

Inventions relating to Plumbing and Heating a Specialty

138 Liberty Street, NEW YORK

MEMBER: New York Electrical Society. Franklin Institute of Pennsylvania, American Society of Mechanical Engineers, American Institute of Electrical Engineers. National Association of Stationary Engineers.

PIPE FITTINGS AND VALVES

TRADE MARK JOHN SIMMONS CO. TRADE MARK

110 CENTRE STREET, WHEN WRITING MENTION DEPT. D.E. NEW YORK.

Domestic Engineering

Published Weekly by Domestic Engineering (Incorporated), $1.00 a Year, 5 cents a Copy. Office: 58-64 North Jefferson Street, Chicago. Tel. Monroe 816.

Advertising—Copy and cuts for advertisements should be received by the last day of the week preceding publication. We cannot guarantee insertions or changes in advertisements if received later.

Entered in the Postoffice in Chicago, Illinois, as mail matter of the second class, Dec. 12, 1901.

July 21, 1906.

Classified Advertisements

The rate for advertising under this heading is 10 cents a line an insertion. The average advertisement runs six words to a line. To insure insertion in this column copy should be received not later than Wednesday afternoon. If received before Thursday evening, advertisements will be inserted under the heading "Late Classified Advertisements" on page 74.—One man from Omaha writes: "I feel on good terms with Domestic Engineering, for it was through answering an ad in the 'Trade Wants' column that I am now located in the hustling western country, having come here from New Jersey."

Help Wanted.

WANTED—A BOOKKEEPER WHO has had not less than three years' experience in the plumbing supply business. No. 538, DOMESTIC ENGINEERING, Chicago. 7-28

WANTED—SALESMEN WHO CALL on plumbers to handle side line; $3 commission; quick and easy seller; sample goes in vest pocket and will be sent you for the asking. State your line and territory, addressing Fred Schulder, 613 St. Clair Ave. N. W., Cleveland, O. 7-28

Situations Wanted.

WANTED—POSITION BY NON-UNION plumber; no bad habits and not afraid of work. No. 533, DOMESTIC ENGINEERING, Chicago. 8-4

WANTED—STEADY POSITION BY experienced plumber and steamfitter; can estimate; western town preferred. Address Lock Box 374, Vermillion, S. D. 7-28

WANTED—POSITION AS FOREMAN in some well established plumbing firm; western town preferred; practical man with 12 years' experience. No. 527, DOMESTIC ENGINEERING, Chicago. tf

WANTED—A POSITION BY SALES agent by one thoroughly acquainted with all the plumbing, heating, water and gas works trade in the entire country. I can increase your business through your regular salesmen or by mail. Possibly you want to reach a better class of trade. I can do it for you. No. 537, DOMESTIC ENGINEERING, Chicago. tf

For Sale.

FOR SALE—RIDER-ERICSON PUMP, $25. John Hardin, 4543 Cott. Gr. av., Chicago.

FOR SALE—$500 WILL BUY A well established plumbing and heating business in a city of 6,000 in Eastern Illinois; reason for selling, want to go west. No. 535, DOMESTIC ENGINEERING, Chicago. 7-21

FOR SALE—ADDRESSES OF WHOLEsale stove, range and furnace dealers in the United States and Canada. No. 448, DOMESTIC ENGINEERING, Chicago. tf

FOR SALE—A WELL-ESTABLISHED plumbing business; stock about $2,000, new, clean and well selected; new sewerage; will sell half to good, sober plumber. L. D. Slaughter, Opelika, Ala. 7-21

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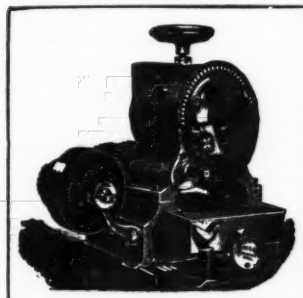

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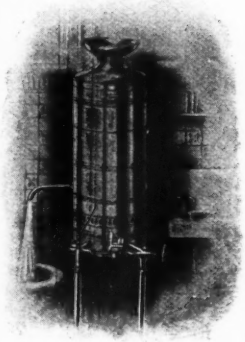

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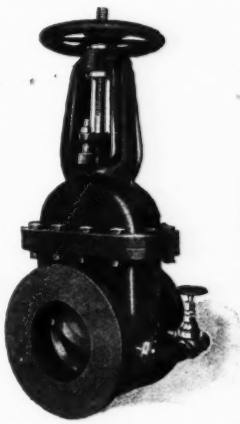

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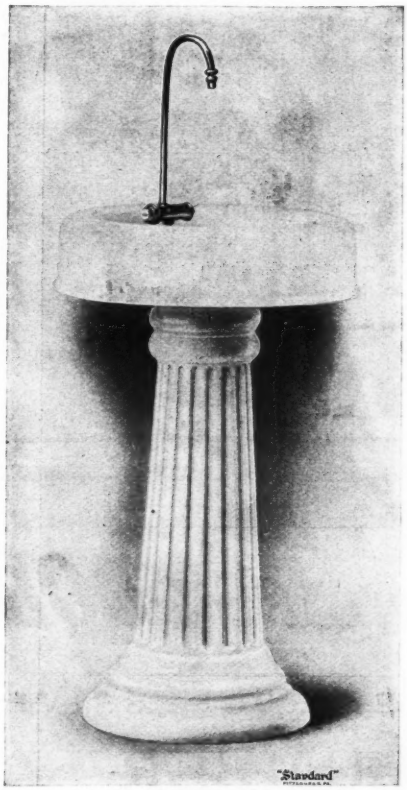

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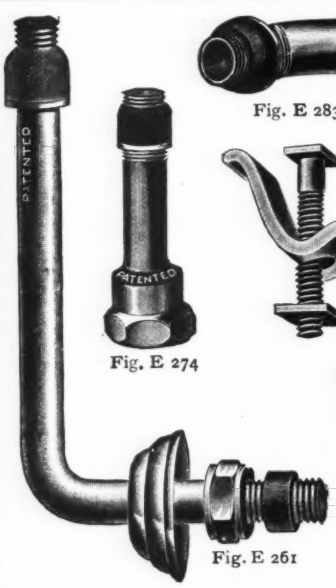

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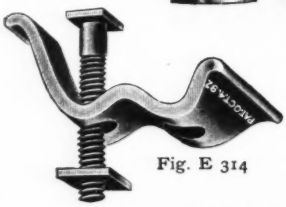

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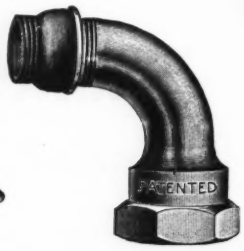

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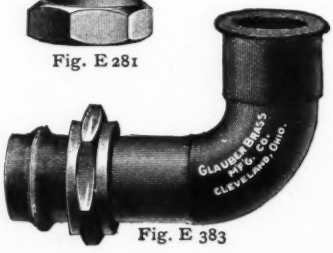

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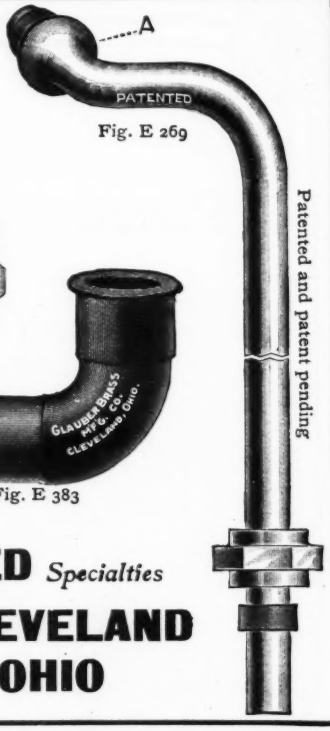

Fig. E 269

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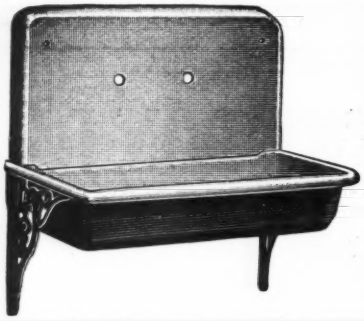

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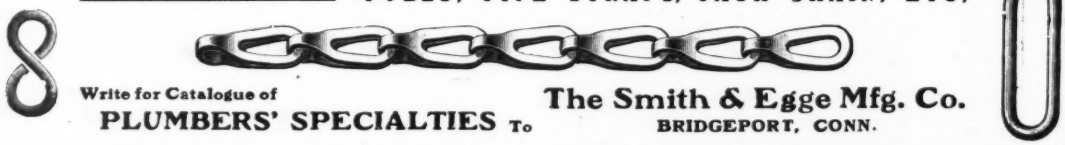

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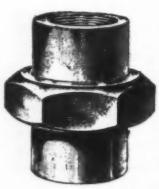

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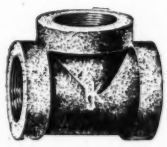

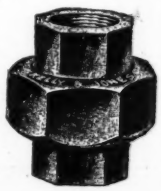

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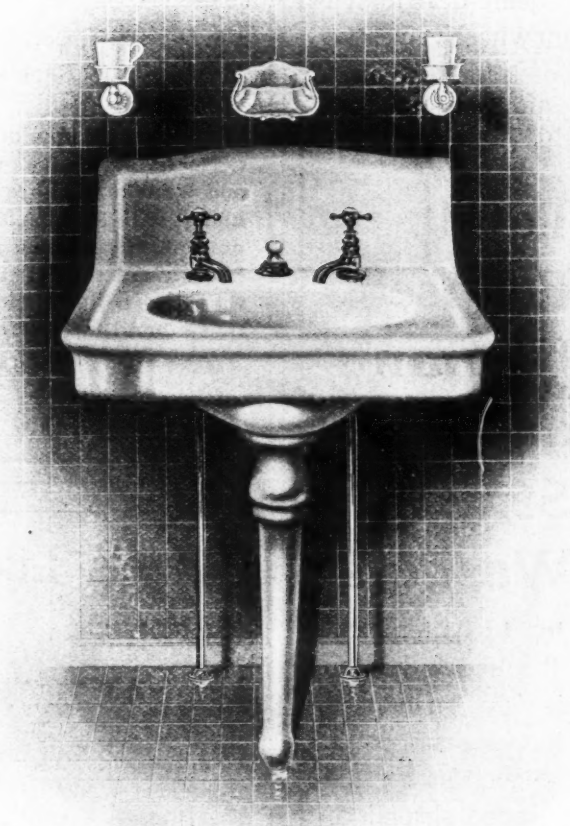
Ideal Solid Porcelain Ware



An entirely clay product

Size No. 1

Slab 24" x 21"
Back 8" high
Apron 4" deep
Bowl 16"x12"

Lavatory and leg with wall supports
List "A" quality $31.50
List "B" quality $22.50

Size No. 2

Slab 26" x 22"
Back 8" high
Apron 6" deep
Bowl 17"x13"

Lavatory and leg with wall supports
List "A" quality $37.50
List "B" quality $26.25

PLATE 842½ G

Square lavatory with integral back—set upon one porcelain leg.

The Largest Manufacturers of Sanitary Pottery in the World

The Trenton Potteries Company

Trenton, New Jersey, U. S. A.

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A Square Deal

You can't get a square deal from a hydrant that isn't made right. You can't get a square deal from a hydrant whose valves are made of leatherette or of cheap flimsy leather not properly shaped.

"Total Eclipse" Hydrants and Street Washers

from top to bottom and from the middle to the outside are guaranteed good in every particular. We use good leather and we cut it and shape it to exactly fit the work we want it to do. And we furnish you with extra parts so that you can easily make repairs. For sale by jobbers everywhere.

JOHN C. KUPFERLE

Established 50 years **St. Louis**

Headquarters for

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Manufacturers of

RE-MA-CO TANK LININGS FOR WATER CLOSETS

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Reynolds Mfg. Co.,
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We know of no place where the water is as bad as at McKeesport, Pa., and we take pleasure in stating that since using your RE-MA-CO linings we have not had the slightest trouble. The water has no effect upon them and we believe that they will take the place of metal linings when they become known.

Yours very truly,
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McKeesport, Pa.

There's Luck in this Line

for you. This rabbit-ear basin cock shows the excellent design our brass goods have. Every item in the full line is made equally well. There is strength, quality and quantity of good red metal, right price. We send samples and prices to reliable houses.

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Mueller Water Tapping Machines

No. 2 Mueller Original Machine

C-001

The parts of Mueller Water Tapping Machines are not bolted together, but are screwed together, iron to brass, making joints that cannot rust. It's no trouble to take them apart if occasion demands. Mueller Tapping Machines are made in three patterns for different classes of work. The machine illustrated makes taps up to 2 inch and inserts corporation cocks up to one inch.

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H. MUELLER MFG. CO.

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All sizes ½ inch to 3 inch inclusive for Top, Bottom or End Supply and also for low Down Tanks with special float. Removable seat of best steam metal. Floats stamped with our B. B. throughly guaranteed.

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Boston Brass Company,

36 & 40 Oliver Street, Boston, Mass.

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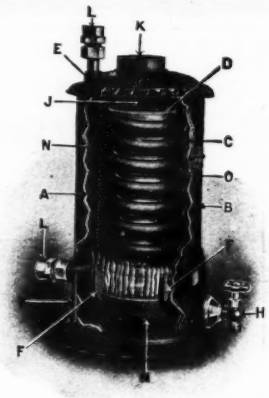

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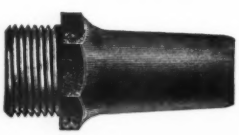

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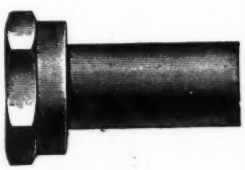

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PLUMBERS BRASS GOODS.

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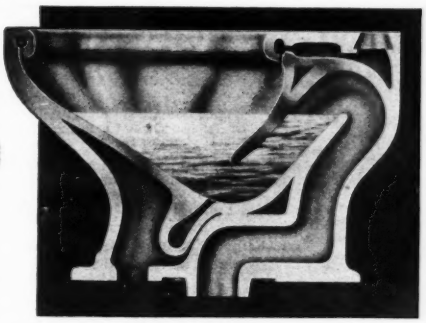
TRADE MARK

For the Sanitary Plumber



The plumber who installs the Sy-Clo Closet, has taken the most important precaution against the perils of improper sanitation, and the two dangers common to all ordinary closets.

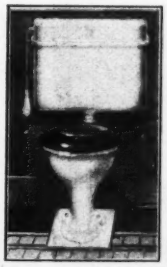
One of these is the danger from within—imperfect cleansing. The other is the danger from without—the escape of the deadly sewer gas into the home.

Being formed of a single piece of solid white china, the Sy-Clo Closet is without crack, joint or seam for the lodgment of impurity. Nothing can adhere or be absorbed.

By an unusually deep water seal between the closet bowl and the sewer connection, making the escape af gas impossible, the Sy-Clo Closet gives adequate health protection against the dangers from without.

The Sy Clo Closet has a double cleansing action. A copious flush of water from above starts an irresistible syphonic action from below. The downward rush of the water through the pipes creates a vacuum—a powerful pump-like *pull* which instantly empties the bowl of *all* its contents instead of merely diluting as does the ordinary closet.

The word Sy-Clo stamped on a closet signifies protection to plumber and patron alike; that it is constructed of the best material, with the aid of the best engineering skill, under the direction of the Potteries Selling Co., and that it has the endorsement of the following manufacturers who have agreed that "Sy-Clo" shall represent the highest standard of closet construction.



The Acme Sanitary Pottery Co., The Bellmark Pottery Co., The Brian Pottery Co., Fidelity Pottery Co., Keystone Pottery Co., Thomas Maddock's Sons Co., Jno. Maddock & Sons, The Sanitary Earth. Specialty Co., The Trenton Potteries Co., The Willets Manufacturing Co., Trenton, N. J.; Camden Pottery Co., Camden, N. J.; The Great Western Pottery Co., Kokomo, Ind., and Tiffin, O.; Ironsides Pottery Co., Bordentown, N. J.; The Standard Sanitary Pottery Co., Elizabeth, N. J.; Universal Sanitary Mfg. Co., New Castle, Pa.; The Wheeling Potteries Co., Riverside Department, Wheeling, W. Va.; The National Pottery Co., Evansville, Ind.; The Columbia Pottery & Manufacturing Co., Kokomo, Ind.

Sy-Clo Closets are made in all sizes and to suit every conceivable plan. For full particulars and descriptive literature, address

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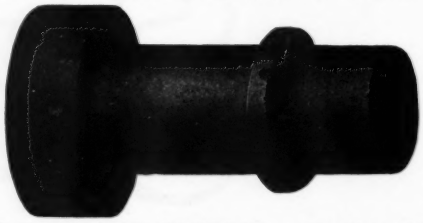
in castings are quickly and permanently repaired with "Stick-To" Cement. See next week for picture of this casting made perfect. **Ask for sample.**



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Note these Prices:	25 ft.	40 ft.	50 ft.	60 ft.	75 ft.	100 ft.
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Sole Manufacturers

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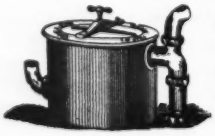

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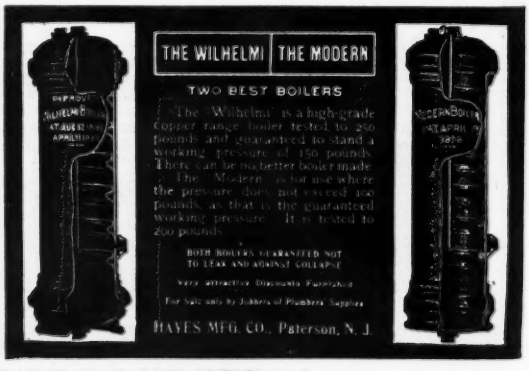
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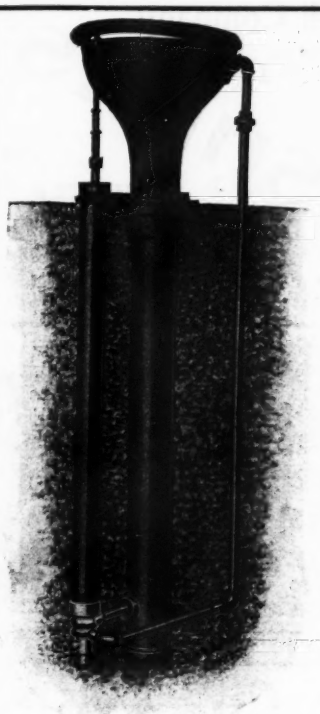

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water-closet, with all the work done before it leaves the factory, so that the plumber's installation is quickly and accurately done, has made a big hit with the trade. This is No. 1, flushes when seat is occupied; trap and valve all below frost line; is made in 2, 3, 4 and 5 foot lengths, and roughs in at 11 inches from soil pipe center.

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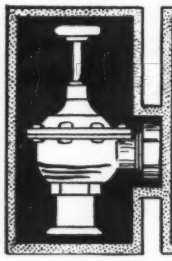

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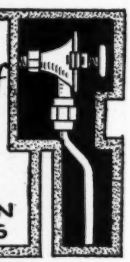

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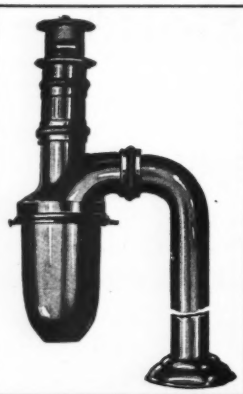

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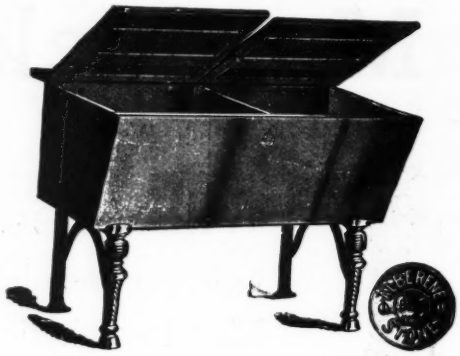

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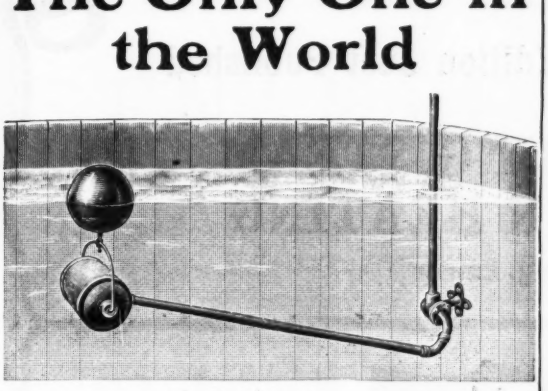

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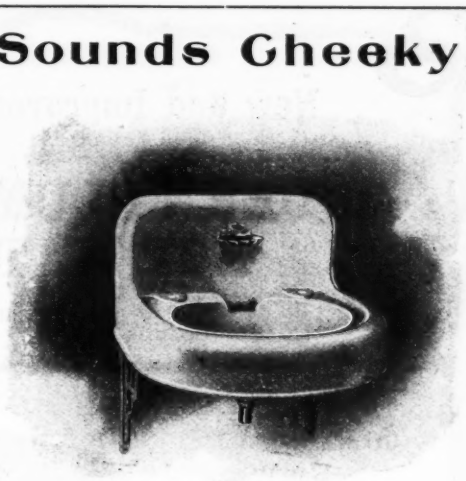

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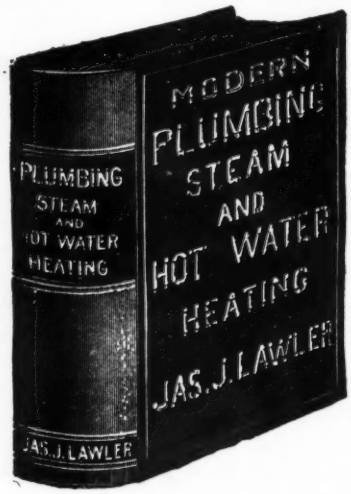

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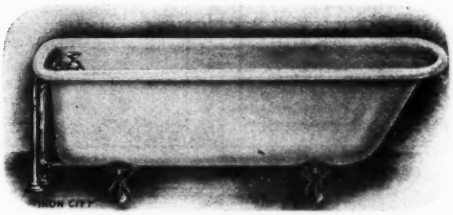

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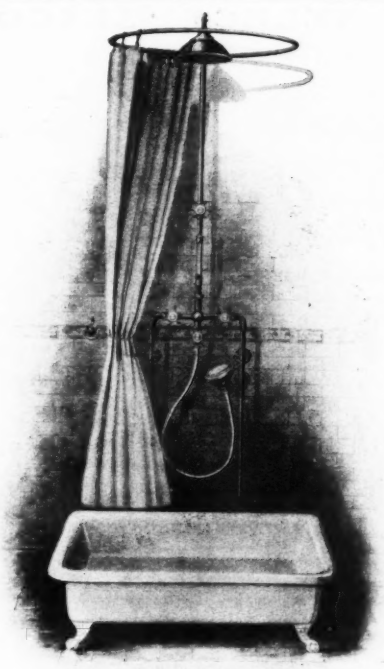

Kohler's Superior

Porcelain Enameled Iron "Niagara" Receptor

DIMENSIONS

No. 1—Width over rim.....36 in.
Length over rim.....36 in.
Depth at Waste hole..... 6 in.

No. 2—Width over rim.....42 in.
Length over rim..... 42 in.
Depth at waste hole..... 8 in.

COMPLETE AS ILLUSTRATED	Lists
Plate K 248—If No. 1—Enameled inside and exterior Finished with No. 1 Ivory Paint.....	$77.15
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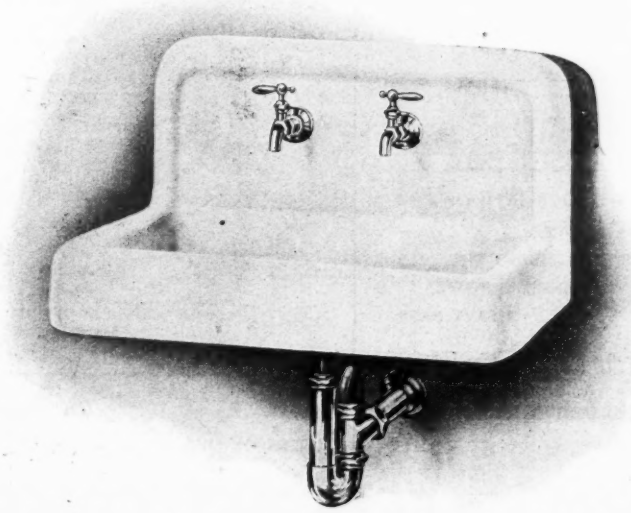
In this sink we discard the old fashioned strainer, collar and bolts, and furnish instead a nickel plated plug which connects direct with the trap. No use doing it the old way.



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Full line of samples can be seen in our New York salesroom (ground floor) 101 Beekman Street, THOS. H. HUTCHINSON, Manager.

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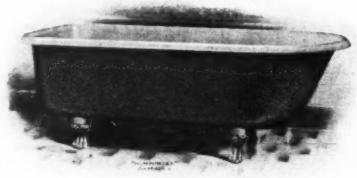

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IS OUR NEW DESIGN IN A

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BATH TUB

The design, finish and general excellence of the "Pilgrim" are sure to please the most exacting.

"PILGRIM" DIMENSIONS

Width, over rim, 26 inches — Width of roll rim, 2¼ inches
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THE SELECT "SESCO"

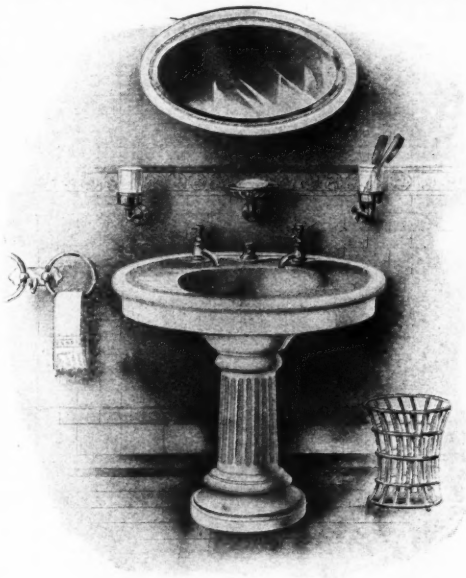

Plate 1-A

"Sesco" Vitreous China Oval Lavatory. On Vitreous China Concave Fluted Pedestal. For prices and other styles, write

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BECAUSE BY SO DOING WE FILL A WANT AND AT THE SAME TIME MEET A STRONG DEMAND.

THE ALTON CLOSET BOWL

IS WITHOUT EQUAL FOR PUBLIC USE.

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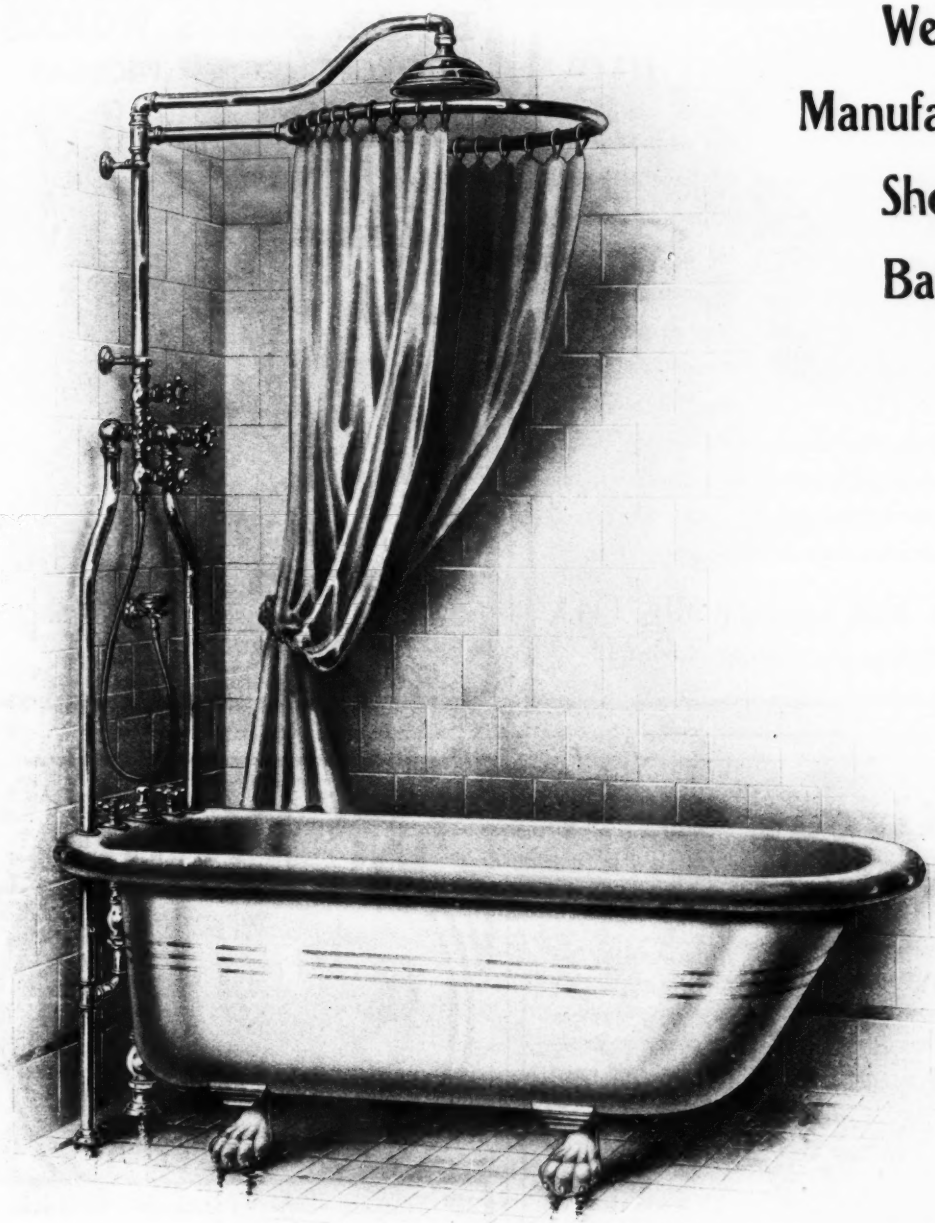

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Nickel Plated Shower with Shampoo Attachment, with Curtain Ring and Rubber Curtain, with Low Bell Supply Bath Fixture complete. All Valve Handles and Waste Top with China Index Centers (no tub), list.....$75.00
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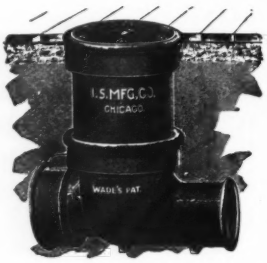

For years plumbers have devised traps and installed back-venting to keep drain air from entering houses, and until the **"Wade"** flushing devices were invented no attention was paid to keeping the drains clean so that the air will not be noxious. Our free catalogue describes the full line of goods. : :

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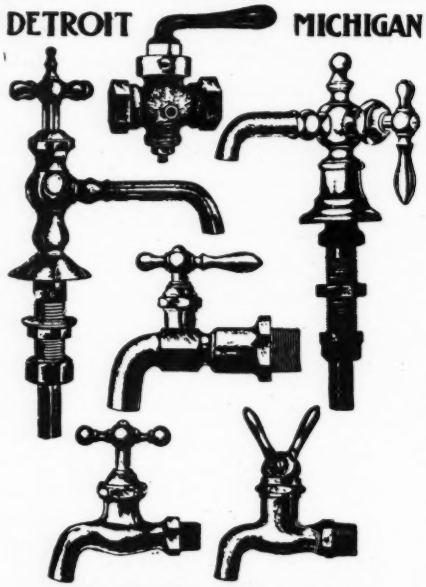

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Works right because made right

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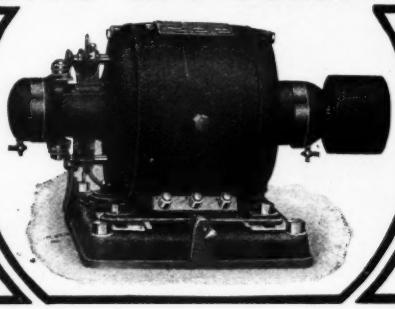

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Patent "Crown" Handle Self-Closing Work

We are not introducing this line. It is known to all prominent Architects and Plumbers.

BUT

as usual, SUBSTITUTES HAVE BEEN PLACED ON THE MARKET.

BEWARE OF THIS

These substitutes are constructed similar to the OLD "BOSTON" OR "ZANE" LINES, and a handle slightly different in design to our "Crown" handle is used to deceive the Trade

DON'T BE DECEIVED

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The Sanitary Company, Cleveland, O.

We Believe

we were the first to manufacture a satisfactory water tank lining. We secured a United States patent and have made **THE F. & K. NEVER-LEAK** for years. It has come to our attention that others are manufacturing a lining similar to ours. We therefore issue

A Warning

to the trade and notify all dealers and users as well as the manufacturers of said similar linings to discontinue to make, sell or use said similar linings, as it is an infringement on our patent, and all who sell or use said linings are liable to us for damages, and we will protect our rights.

FINDEISEN & KROPF MFG. CO.

Manufacturers of "NEVER-LEAK-TANK-LINING" Patented

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HIGH GRADE PLUMBERS' WOODWORK

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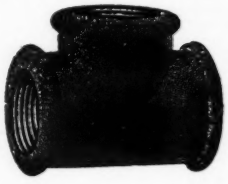
Standard Weights
Tapped True



We manufacture and carry in stock all of the leading sizes

MALLEABLE BEADED PATTERN BRASS FITTINGS, MALLEABLE PLAIN PATTERN BRASS FITTINGS
Rough, Tinned, Dipped, Polished, Nickel-Plated, with iron pipe standard threads, also fine threads.

CONE JOINT BRASS UNIONS, HEAVY PATTERN MADE CORRECTLY
Round ends, Octagon ends, iron pipe threads and fine threads. Rough, Polished or Nickel-Plated.

FITTINGS FOR PLUMBERS' TUBING
Polished or Nickel-Plated, 1¼ inch and 1½ inch, 45° and 90° elbows with fine threads, also other styles usually used.

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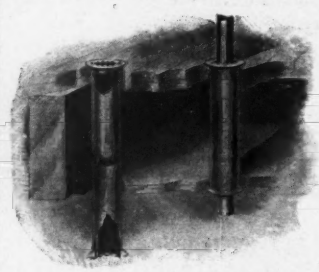

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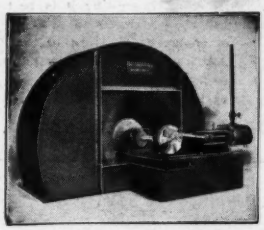

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